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# SOAP and SANITARY CHEMICALS

## CONTENTS



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# AS THE EDITOR SEES IT

RECOVERY from the first shock of the recent national election is just beginning to make itself felt in business and industry. Had the average American business man been dropped unexpectedly into a tank of icy water, his astonishment on November third could have been no greater. And we have a hunch that the top men of American labor, in spite of their voiced assurances of a Truman victory, were no less amazed at the outcome. But irrespective of individual feelings over the results, the latter speak for themselves and business must live with them over the next four years if not longer.

American industry, by and large, has opposed many new deal innovations over the past sixteen years particularly those which have permitted labor leaders to run wild, and others which have encouraged unnecessary interference of government in business. But, industry has lived with the new deal, has not been forced to close up shop, and ostensibly has done quite well for itself. Of course, during the period, we fought a war, spent billions for armament, increased our national debt ten fold, and saw taxes skyrocket. But, we lived through it. So, maybe the next four years may not be as bad as industry anticipates.

From the angle of business, the present administration in Washington has rid itself of much of the unsound thinking and the economic crackpots of the earlier days of the new deal. With the responsibility entirely theirs on and after next January twentieth, we feel that the more sober minds of the new administration will hold sway. We do not believe that they will be foolish enough to permit a few irresponsible labor leaders to run wild again, nor to tax business and industry beyond the point of endurance. They do not want to bring on full-scale inflation and subsequent depression with its closed factories and unemployment any more than does industry. And they must know that lacking another war to boom things up all over again, the path of the early days of the new deal can lead nowhere else.

Frankly, we do not believe that the new administration will move against industry and business to anything like the degree apparently anticipated following the first reaction to the election results. Full responsibility usually engenders a more sober appreciation of fact. To drag industry into the mire would be to drag the entire nation along with it, a situation obviously which nobody wants.

DURING the past two months, competition in soap selling has become keener, if we may judge by reports here and there in the industry. In the case of private brand soaps, this development appears to be more pronounced than in the nationally-advertised brands. A tendency by soapers to cut prices on private brand business has been noted. Some marketers of private brands are reported to have stepped up their sales activity and continue to do a good business. But the majority in this category are stated to have suffered a marked drop off in sales, especially on luxury soap items. Consequently, soapers are meeting increased sales resistance and frequently lower-priced competition. Ability to meet lowered prices has been complicated decidedly by an uncertain tallow situation.

All in all, the life of the average soaper of late has been far from honey and roses. And as he looks over current sales, he may wish for "the good old days" of 1947 and before when anything which resembled a bar of soap could be sold and no questions asked. But even then, he wished that the harem-scarem market for soap and raw materials would end and things would again return to "normal." Well, now they are "normal" and soap is hard to sell, competition has reared its ugly head, and prices are being cut.

The plain and unvarnished explanation, as we

see it, to the sales as well as some other current problems of most soapers is that the honeymoon has ended. We are back to "normal" in more ways than one. The way to move soap henceforth and hereafter is apparently to send salesmen out to sell it. Soap is not going to be "bought" for a while, we fear. It is going to be sold!

NEWLY marketed products are usually easy to spot. Label and advertising claims are frequently exaggerated,—the product is different, it is revolutionary, it is wholly and completely superior to "ordinary" products of like nature, and it marks the beginning of a new era in this particular household item. Never is it just another good soap powder or detergent or scouring powder or shampoo with the usual shortcomings of such products. Always it is strikingly different and flawless. Always it is the result of a miraculous discovery after ninety-nine years painstaking effort "in our research laboratory." Invariably, it will do just about everything at the kitchen sink or washtub except play the harmonica.

Why it is that the average marketer of a new item feels that he must put on an act like a circus barker is beyond us. But, apparently this appears to have become standard practice beyond the ken of such as we. That the product may rise in the blue like a skyrocket and just as quickly take a nose dive has been and is being illustrated each passing year. Granted that retailers insist upon some sort of "strong" advertising attention for such new products as they will condescend to place on their shelves. But, must this always follow the same old hackneyed pattern, the same old threadbare advertising and label baloney?

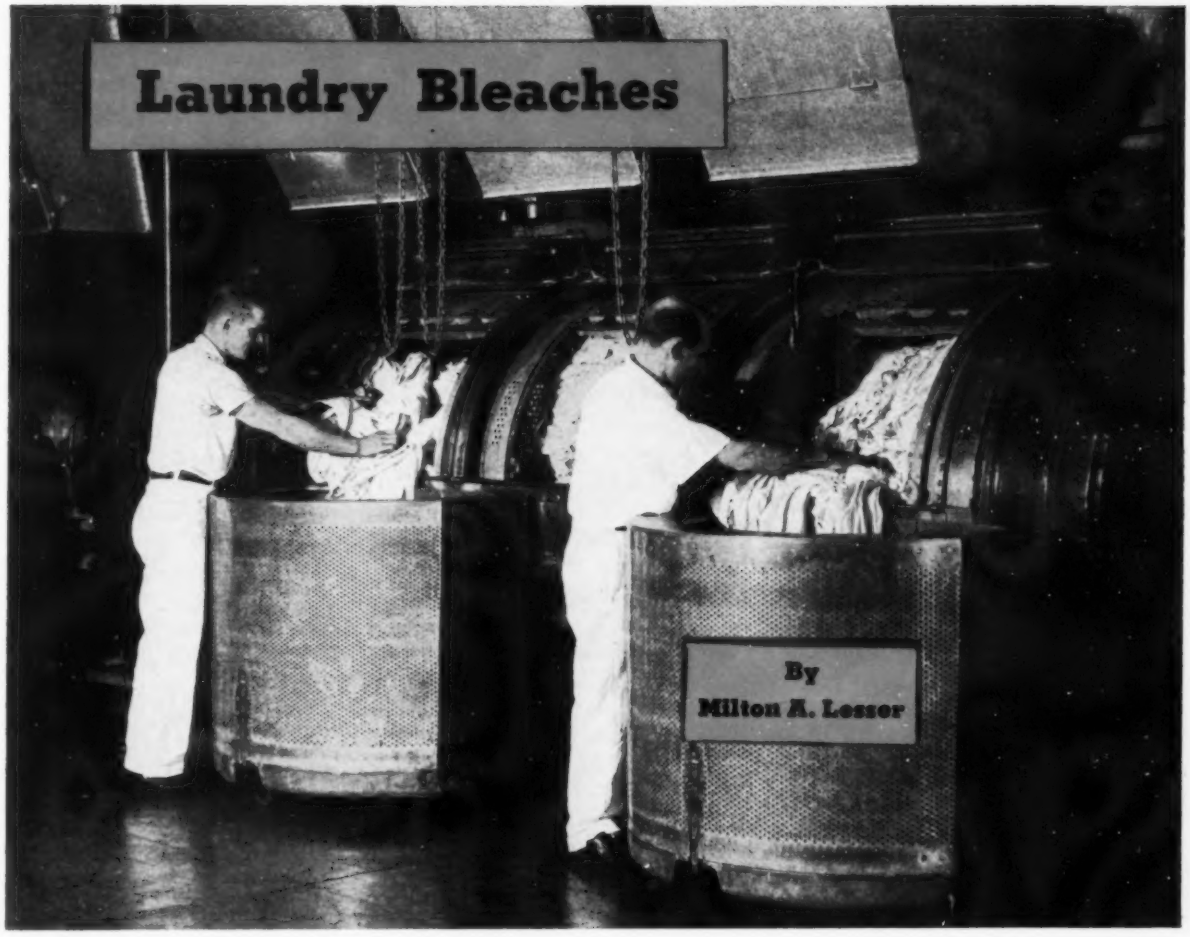
The growing interference of government agencies in business year after year is no coincidence. This kind of marketing invites it.

AT what concentration should liquid soap be used in dispensers and dispensing systems? Some ten years or so ago, we put this question to a number of manufacturers with a view to publishing recommendations which might be of some value for passing along to users. But, as our published results showed, the answers varied all the way from five per cent up to twenty per cent anhydrous soap. Many of those who answered our questionnaire gave the reasons for their recommendations. Although a five per cent soap might not be as satisfactory for a quick hand-washing job as a fifteen or twenty per cent product, quick rinsing, reduced chapping effect in cold weather and fewer plugged up dispensers were cited to back up this admittedly low figure. Those who held out for fifteen and twenty per cent soap, maintained that this concentration was necessary for a quick lather and a good cleansing of the hands. The majority held out for a concentration ranging between twelve and fifteen per cent.

Recently, we have been looking into this subject again with a new interest. Our feeling is that users of liquid hand soaps either are adding water and cutting down their concentrations, or their suppliers are delivering inferior products. Our guess is that the concentration of soap in most public dispensers is too low and that too large a quantity is needed to work up a lather on the hands under ordinary conditions. How this is a saving to anybody we are at a loss to understand. Instead of pumping the dispenser three or four times, the user pumps eight or ten times. Instead of requiring ten or twenty gallons of liquid soap per week or month for a given number of dispensers, twice the gallonage is purchased. Furthermore, poor grade liquid soap in one dispenser tends to give a black eye to all liquid soaps. An interesting subject which might bear investigation, — and subsequently, education along the lines that the cheapest soap is very often the most expensive to the buyer.

ALTHOUGH the West Coast shipping strike appears to be about settled, thus making available badly needed coconut oil, the situation with respect to coconut and copra supplies from the Philippines has some of the boys scared. Not only do reports persist of typhoon damage cutting into supplies of copra and coconut oil, but the uprising of the Huks in and near the copra producing regions has sent up storm warnings of a different type. With the usual communistic backing and support, the Huks are reported marching into southern Philippine copra producing regions causing destruction and upsetting production. Some experienced observers are really worried about the situation.

# Laundry Bleaches



By
Milton A. Lesser

MOST of the dirt present on launderable fabrics can be removed by the usual methods of washing. However, there are certain types of discoloration and various soiling substances which do not yield readily to ordinary washing with soap and alkali. Therefore, it has become common practice to use bleaches to combat yellowing of fabrics and to remove many of the more stubborn stains. Most people realize that the correct use of bleach is an important part of the washing process, whether in the home wash tub, the automatic washing machine or the wash wheel of the commercial laundry.

The value of bleach in the laundry does not rest solely on the fact that it helps to whiten fabrics and aids in stain removal. As noted by Oesterling, (1) the functions of a bleach in laundering are (a) to remove stains, (b) to help retain original whiteness of the washed fabrics, (c) remove the last trace of bluing, and (d) act as a sterilizer. There is a growing appreciation of the action of bleach as an antibacterial agent. As remarked by Wright, (2) the bleach operation in a commercial laundry formula may be classed as one of the most positive and powerful destroyers of bacteria. Laundries use therapeutic amounts of bleach in the operation. Wright cites observations which clearly show that the bleach exhibits its germ-killing power for most of the time normally assigned to this step. Next to the "break," where most of the bacteria are removed, the bleach accounts for the greatest drop in bacterial count.

### *Primary Function to Whiten*

NONETHELESS, the primary function of a laundry bleach is to whiten fabrics. (3) Calling attention to studies made by the American Institute of Laundering, Johnson (4) recently pointed out that in order to obtain satisfactory whiteness retention in white cotton fabrics, the use of bleach is required in the washing formula. However, bleaching agents cannot be used as substitutes for detergents and efficient detergent operations are required to obtain satisfactory whiteness retention. Of interest in this connection is Chamberlain's (5) observation that bleaching agents aid in removing soil by physical action. Offering evidence to support this view, he states that bleach removes colloidal soil particles from the surface of textiles, after which these particles are suspended in the soap solution.

However this may be, it is well established that bleaching is basically a chemical process—one that requires a deflnite degree of control to obtain optimal results. (6) Trouble usually follows when bleach is not properly used. At one extreme there may be a failure to obtain the desired

whitening and stain-removing effects. At the other extreme there is the possibility of damage to the goods. As remarked by Smither, (7) unless it is controlled, bleaching is probably the most destructive of the various operations in laundering, especially to delicate fabrics.

The mechanism by which a bleach removes stains and whitens cloth differs with the kind of bleaching agent. In laundering practice, both oxidizing bleaches and reducing bleaches are used. Put simply, the former cause the staining material to combine with oxygen and the latter usually removes oxygen; colorless or soluble substances being produced in both cases. The stain is thus either decolorized or is dissolved by the wash liquid. (8)

Considered broadly, oxidizing bleaches include chlorine compounds, peroxides, perborates, permanganates, and ozone. The reducing bleaches include sulfites, hydrosulfites, and oxalic acid. (7) More specific and also more indicative of current practices is Johnson's (4, 9) list of bleaches and stain removal agents. Under oxidizing types he includes sodium hypochlorite, hydrogen peroxide and sodium perborate. The reducing types are sodium bisulfite, sodium hydrosulfite, titanous chloride and titanous sulfate.

The oxidizing types are by far the most important. Reducing bleaching agents are used in the textile trade more extensively than in the laundry industry. These substances will not be discussed in this review, which is concerned primarily with oxidizing bleaches. Of the oxidizing types, sodium hypochlorite solution known to the trade as Javelle or Javel water, is unquestionably the most widely used bleaching material. In his discussion of laundry bleaches, Lyndon (10) has remarked that the bleach considered most suitable for laundry washing is one with chlorine as the active agent. Noteworthy in this connection is the statement (11) that chlorine is the most effective bleach for washed fabrics, with active oxygen compounds second and sun bleaching a poor third.

To get sodium hypochlorite, both the home laundress and the professional laundryman may purchase prepared bottle bleach for dilution as required. In commercial laundries, it is also rather common practice to prepare the solution from so-called high test calcium hypochlorite and soda ash. Rarely today do laundrymen prepare the bleach from bleaching powder and soda ash. During recent years, and especially with the availability of improved, safer equipment, more interest has been focused on methods for making hypochlorite bleach in the laundry from chlorine gas and alkali. Electrolytic processes seem to hold but little interest for the practical laundryman. (12)

As explained by one authority, (10) sodium hypochlorite is sodium, oxygen and chlorine combined according to the formula, NaOCl. As an oxidizing bleach, it owes its bleaching power to the fact that it readily gives up oxygen which in turn is capable of decolorizing stains, killing bacteria and whitening cotton and linen. Though effective on these vegetable fibers, hypochlorites are damaging to silk and wool and must never be used for bleaching these fabrics. Even cotton and linen may be damaged appreciably unless the chlorine concentration, temperature and bleaching time are carefully controlled. Ordinarily, no bleach should be used on colored or dyed goods. (7)

Standards for the important types of chlorinating agents or bleaching materials are given in Federal Specifications O-B-441a. These specifications describe calcium hypochlorite, containing not less than 70 percent available chlorine; two forms of bleaching powder, containing 30 and 35 percent available chlorine, and sodium hypochlorite solution. This last must be sediment-free, have an available chlorine content of not less than 10 percent by weight and a free alkali content of not more than 1.5 percent by weight.

Bleaching powder, a product long known to sanitation science and industry, is also called chloride of lime, bleach, chlorinated lime and sometimes, incorrectly, is referred to as calcium hypochlorite. It has a rather variable, indefinite chemical composition but is generally accepted to be a mixture of calcium hypochlorite and calcium chloride. It is prepared by rather simple procedures involving the passage of chlorine gas over hydrated or slaked lime. (13)

### "Wet" Process Bleach

A DIFFERENT procedure, a so-called "wet" process is employed to produce high test calcium hypochlorite. In such a method, a lime slurry is chlorinated to produce the calcium hypochlorite; the chlorination being continued until the compound crystallizes out of solution. The calcium chloride, also a product of the reaction, is removed separately. (14) Modifications and improvements in production methods are constantly being made. (15) Available since 1927, (16) calcium hypochlorite not only provides about twice the amount of available chlorine, but is also much more stable than bleaching powder. Sold under various trade names (e.g. "H.T.H.," "Perchloron," "Chloresco," "Hoodchlor," "Pittchlor") these properties have made for better distribution and storage of chlorine sources in dry free flowing and comparatively stable form. Conveniently packed to facilitate operations, these newer products are displacing bleaching powder for the production of liquid laundry bleach and related materials.

For example, most manufacturers or distributors package high test calcium hypochlorite in 3-¾ pound cans. The contents of one such can are mixed with a like amount of soda ash and 30 gallons of water to yield the one percent bleach commonly used in the commercial laundry. (17) In detail, the procedure for preparing this stock solution is as follows: Empty one can (3-¾pounds) of calcium hypochlorite in 15 gallons of lukewarm water and stir thoroughly. Add 3½ pounds of soda ash (or six pounds of modified soda) and stir for several minutes. Add sufficient water to bring the volume up to 30 gallons and allow to settle for one to two hours. The clear liquor is sodium hypochlorite solution containing one per cent available chlorine.

By using the same ratio of ingredients, it is of course quite easy to make larger or small quantities of one

***Bleaches are of two broad general types,-oxidizing or reducing. The oxidizing type is the more important,- including chlorine compounds, peroxides, perborates, permanganates and ozone.**

per cent bleach. By varying the proportions, solutions of different strengths are obtained. Such preparations are often manufactured for use in the home, not only as bleaches for clothes, but also as disinfectants, germicides and deodorants. According to Belanger, (18) such a solution can be prepared from:

| | |
|---|---|
| Calcium hypochlorite | 15 lb. |
| Light soda ash | 10 lb. |
| Water | 30 gal. |

Mix the calcium hypochlorite and the soda ash separately, each with 15 gallons of water. Pour the two solutions together. Let stand and then decant or siphon off the clear solution. This will yield a fluid having about 2.8 per cent sodium hypochlorite. To whiten cottons and linens in the home laundry, a soak is made by adding one tablespoonful of the solution to a gallon of water. The quantity is varied for other purposes.

Although not much is used in modern laundries, a typical method for making Javel water from bleaching powder should be cited. For this purpose, 10 pounds of chlorinated lime and 10 pounds of soda ash are used with 30 gallons of water. After mixing well until the reaction is completed, the solution is allowed to settle over night, after which the clear liquor is siphoned off to provide the usual one per cent bleach. (17)

As explained by Harvey, (13) the great disadvantage in the use of bleaching solution made from bleaching powder is that it contains lime compounds. By reacting with any soap which may be present in the fabric, these form insoluble lime soaps, the effects of which, like streaky marks on linen, are all too well known to the laundryman. Further, there is always a certain amount of free lime in the bleaching powder solution. Contact between this free lime and the goods to be washed should be avoided.

In addition to the use of these dry chlorine carriers, laundry bleach is also prepared by directly treating an aqueous solution of soda ash or caustic soda with chlorine or by electrolyzing an aqueous solution of sodium chloride. The most economical and probably the most frequently employed method for making liquid laundry bleach on a commercial scale is the direct process in which chlorine is made to react with a solution of caustic soda. The results will depend on a number of factors such as the strength of the sodium hydroxide solution, the rate of flow of the gas, the temperature and, in some measure, on the relative depth of the liquid.

Detailed information on the production of liquid bleach by such methods is often provided by manufacturers of chlorine and alkali. Valuable data are also provided in technical discussions, such as that of Levitt. (19) Following a comprehensive review of procedures and equipment he notes that, in the formulation of sodium hypochlorite bleach, it is always advisable to have a slight excess of caustic soda. This amounts to 0.25 per cent in a one per cent bleach and to about one per cent in the 15 per cent product. This excess acts as a stabilizer for the chlorine, otherwise the carbon dioxide from the atmosphere would immediately begin to decompose the solution.

As pointed out by Johnson, (16) these liquid chlorine bleaches are extensively used in large urban areas where a good market is available to local jobbers. Usually the solutions are made up in 12 to 15 per cent concentrations and are distributed in glass carboys. This carboy hypochlorite is diluted with water to make the requisite one per cent stock supply. Such dilute concentrations do not decompose on standing if properly stabilized with a suitable concentration of excess alkali.

Of decided interest in this connection are Chamberlain's (5) suggestions for using bleach effectively. To stabilize the hypochlorite stock solution he advises that enough alkali (caustic soda or sodium carbonate) be added to the storage crock to bring its pH up to between 11.4 and 11.8. This acts as a preservative for the bleach and helps to eliminate the drop in pH when the bleach is added to the wash wheel. If stored bleach is kept at or below a pH of 10.5 it will disintegrate rapidly; a one per cent bleach going to 0.5 per cent in a day or so. He also stresses that the bleach be kept in a cool place and that the vessel be kept covered at all times.

### *Few Laundries Make Bleach*

AS was previously mentioned, a few laundries produce their own sodium hypochlorite solution from chlorine and sodium hydroxide solution. In these methods (e.g. the Laval Process) special equipment is used and the process is so controlled that a one per cent bleach is produced. Day (12) feels that such processes are worthy of consideration by laundrymen In his opinion there a number of factors which virtually rule out bleaches made by electrolytic methods.

Much study has gone into the determination of the optimal concentrations and conditions for using hypochlorite bleaches. (20) Especially important is the work done at the American Institute of Laundering. (16) This work showed that in order to obtain satisfactory whiteness retention, no more than two quarts of a one per cent available chlorine solution is required for each 100-pound load. It was found that any use of bleach in excess of this amount rapidly increases tensile strength losses, but gives practically no improvement in whiteness.

This was well indicated by observations which showed that with the two-quart addition, cotton fabrics

were 92.6 as strong after 20 washings as they had been originally. Without the use of hypochlorite solution for the same number of washings, these fabrics were 94.3 per cent as strong. Evidently, depreciation in strength is slight with the correct use of hypochlorite solution.

Such studies also showed that bleaching activity increases with an increase in temperature and with a decrease in the pH of the bleach bath. However, within the range and temperature commonly used in washing, variations in temperature have a greater influence on bleaching activity than do variations in pH.

Obviously the control of bleach conditions available to the commercial laundryman is not attainable by the domestic launderer. However, some of the lessons learned in commercial bleaching practices are applicable in the home wash tub, especially with respect to correct dilutions. Directions for the housewife must be clear and specific. The need for definite label information is emphasized by the fact that home laundering experts (21) stress the importance of following the bleachmaker's recommendations.

While there are deviations, household hypochlorite bleach is usually provided as a five per cent solution. For domestic use, the product is sold in pints, quarts, half-gallons and gallons, the latter often being returnable. As a rule, the solutions are packed in amber bottles to prevent deterioration from the effects of light. (19) As was pointed out recently in one of the technical journals, (22) hundreds of small companies compound such bleaches and sell them within a limited radius. No single company, it was noted has a lion's share of the sales volume.

The patent literature shows that hypochlorites may be used with other substances to obtain better effects of combined action. For example, the rate of solution of bleaching powder of high test hypochlorite preparations can be accelerated by means of chloroethanoic acid. According to the patent, (23) the chlorine compound and the chloroethanoic acid may be made up into convenient tablets with starch or other binder.

In a more recent instance, (24) methods were given for making stable compositions from combinations of hypochlorites and certain surface active or wetting agents. With these agents, the new hypochlorite compositions are capable, even after 5,000 hours storage at 100°F., of producing solutions of good sudsing power and are excellent bleaching, germicidal, disinfectant, and deodorizing agents. The products are made as substantially dry powders,

While the sodium and calcium chlorine compounds dominate the field, lithium hypochlorite has made a bid for a position in the group. The product is, of course, covered by patents, one (25) of which describes the manufacture of lithium hypochlorite containing from 75 to 100 per cent available chlorine. Lithium hypochlorite bleaches are made available as white granular solids. According to the manufacturer's literature (26) a one percent chlorine solution is very easily prepared from lithium hypochlorite and water. No soda ash or modified soda need be added. Hence there is no waiting for the solution to clear and there is no precipitate or sludge to discard. Lithium hypochlorite already mixed with sodium carbonate or sodium chloride is recommended for use in household laundry work.

Of interest with respect to these domestic type products is the study cited by Neidig. (27) She reports that comparisons have been made of a lithium hypochlorite-soda ash mixture containing less than 10 percent available chlorine with the ordinary five percent sodium hypochlorite liquid bleaches. When both were used with soap under the same chlorine concentration and water hardness conditions, the lithium hypochlorite-soda ash mixture gave better soil removal, a higher whiteness retention, and a lower soap consumption.

In passing, it may be noted that sodium chlorite, sold under the trade name of "Textone," is another valuable bleaching agent that may have potentialities in the laundry field. Rather extensively used in textile bleaching, (28) there are some experimental data (29) to indicate that sodium chlorite can play a useful role in the laundry as well. Unlike the hypochlorites, when sodium chlorite is acidified it liberates chlorine dioxide instead of free chlorine. Because of this effect, cellulose acetate rayons, which are easily damaged by hypochlorite, can be bleached by an acidified solution of sodium hypochlorite without danger of injury. (30)

Before concluding this discussion of the chlorine type laundry bleaches, it should be pointed out that products containing more than 10 percent available chlorine are required by Federal law to be labeled "poison" in a specified size and form of type.

### *Peroxide as Bleach*

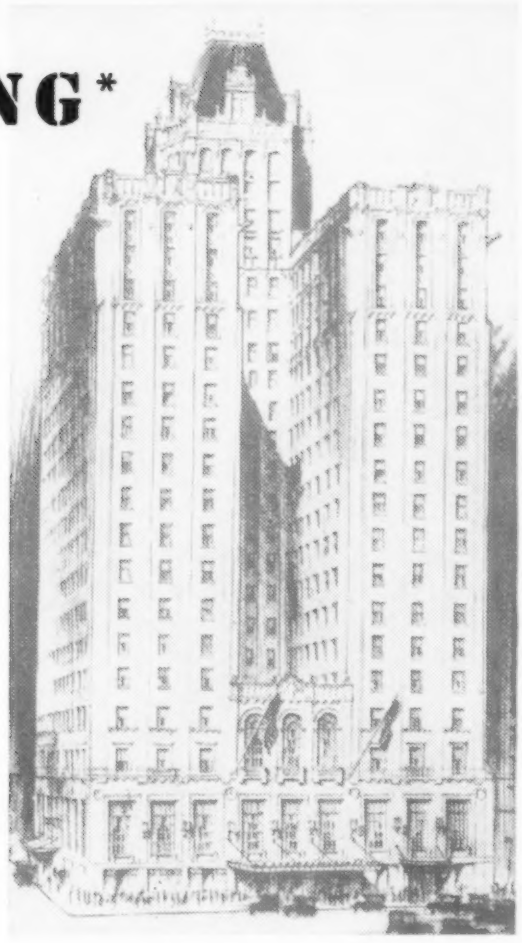
HYDROGEN peroxide now has a rather well established place in the commercial laundry and is occasionally employed in the home laundry. Applicable to cotton and linen, hydrogen peroxide is considered (8) to be the most suitable oxidizing bleach for the treatment of wool and silk. As remarked by Mills, (31) peroxide bleaching is an oxidizing process whereby the coloring matter is either destroyed or made water-soluble. Jackman (8) has pointed out that although hydrogen peroxide is one of the safest oxidizing bleaches when used under proper conditions, it is capable of causing damage to all kinds of fabric if used in too strong a solution at too high a temperature, or if the commercial solution is allowed to dry into the fabric and exert a tendering action.

Studies made at the American Institute of Laundering (16) have shown that when hydrogen peroxide is added to white cotton and linen loads in the proper manner, tensile strength losses are kept within satisfactory limits and good whiteness retention is obtained. It was also found that hydrogen peroxide is of value in keeping white areas clear and bright in cotton fabrics that are printed or woven with a small amount of color. This is frequently the case with cotton prints and shirtings.

Hydrogen peroxide is often made available to laundries in a 100-

(*Turn to Page* 143)

# HOTEL CLEANING*



THE variety of cleaning jobs performed in hotels is large. They differ in the nature of the work, the frequency with which the cleaning must be done, the relative degree of cleanliness that is necessary, the speed with which the various jobs must be done, the type of the surfaces to be cleaned, and the quality of the workmanship. Moreover, effective cleaning depends on two other factors: the detergent chosen for the particular cleaning job and proper rinsing.

It is important that detergent solutions be carefully mixed and handled. Manufacturer's directions for use should be followed closely, but should be tempered by knowledge gained from actual usage of the products. The use of too much or too little detergent material in solution may prevent the product from giving efficient, economical performance.

Rinsing is equally essential to the cleaning process, for it is rinsing a surface which actually washes away the previously loosened soil and leaves it clean. In most instances (e.g. washing of walls, floors, etc.), it is desirable to change the rinse water frequently.

It is advisable to use mildly alkaline solutions for most general house-keeping cleaning operations in hotels. The reason for this is twofold: first, if the alkalinity is high (pH 10.5 or more) the surface being cleaned (marble, linoleum, rubber, asphalt, etc.) may be affected, even to the point of deterioration. Second, the long-continued handling of highly alkaline solutions will tend to emulsify the surface oils of the skin, leaving the user's skin dry and cracked and serious dermatoses may possibly develop.

Since synthetic detergents are normally neutral or mildly alkaline (pH of less than 10), most of these can be depended upon to give good safe results for use on practically all types of surfaces under any condition.

### *Hand Dishwashing*

DISHES, glassware and silverware are usually cleaned by hand in drug store fountains, small counter fountains and similar eating places. It is a method unsuited for the cleaning of dishes and silverware in large hotel operations, where speed and controlled dishwashing require the use of a dishwashing machine. Moreover, since in hand dishwashing, the hands are in continuous contact with the solution, a temperature of 170°F can not be maintained. Such a high temperature is necessary for killing bacteria and sanitizing utensils. The two tabulations on the next page compiled from a recent survey of dishwashing practices in 1,000 New York City restaurants clearly indicate that machine dishwashing surpasses hand dishwashing in lessening the bacteria count found on utensils.

From the figures it can be seen that in the case of glassware and chinaware, there is a substantial difference in bacteria count between the two methods. Yet it is interesting to note that the silverware results show little variation between hand or machine dishwashing. The main reason for this is that silverware is normally not handled correctly in dishwashing machines. Common practice is to overload the wash trays or baskets with knives, forks, spoons etc. to such an extent that the utensils in the middle of a five or six inch pile of silverware are never properly reached by the detergent or by the jets of hot water sprayed in the machine. Although the survey reports the conditions found in restaurant dishwashing practices, this situation of overloading is not

* Based on a report for the American Hotel Association by York Research Corp., Stamford Conn.

peculiar to the restaurant field alone. Therefore, it is quite important for hotel personnel to be aware of such practices and warn those responsible for washing and rinsing against the dangers of overloading. By properly loading the wash trays, knives, forks, spoons, etc., will be satisfactorily sprayed, and at the same time, adequately sanitized.

Detergents used in hand dishwashing should be mildly alkaline otherwise the hands may be affected by a hot-high alkaline solution. A pH of not more than 10.5 is best. The most popular detergent used is soap, which under favorable conditions is very effective, but it must be thoroughly rinsed. As a rule, soap is usually combined with an alkaline salt (e.g. soda ash, modified with sodium bicarbonate or trisodium phosphate). In hard water areas, a sufficient amount of a water softener (a polyphosphate) must be added to condition the water. Yet synthetic detergents, which generally cost slightly more than soap, are much more effective than soaps since they can be used under most any condition with excellent results. The cleaned dishes will rinse easily and upon drying will sparkle clearly and brightly.

Whether a soap—combined or uncombined with other detergent materials—or whether a synthetic be used, the cleaning process is not complete until the loosened dirt has been thoroughly removed by rinsing. Good rinsing can be obtained by placing the dishes in an open tray designed with a long handle, dipping the contents into the hot rinse water, withdrawing them and alowing them to dry.

Many local health boards require the use of a chlorine rinse as a bactericide for the proper sanitization of the dishes, spoons, forks, etc. More recently, the development of so-called quaternary compounds gives every indication of answering the sanitary problem arising in hand dishwashing procedures. These new compounds are as effective as chlorine, and have no objectionable odors.

### *Machine Dishwashing*

MACHINE dishwashing is particularly suitable for hotels. It affords speed of handling during peak load periods, better sanitation and cleaning under controlled temperatures. Detergents with a high pH value can be used, since the hands play no active part in the actual cleaning process. Significant concentrations of soap should be avoided, otherwise the foam will seriously interfere with the cleaning and rinsing operations. In hard water regions soap particularly should be avoided. In fact, synthetics which foam excessively likewise should not be used.

Generally, alkalis are best suited for use in machine dishwashing. Findings of an extensive investigation by the U. S. Navy on detergents used in machine dishwashing, call for a decidedly alkaline product. These findings, which later became the government specifications for machine dishwashing compounds, consider the ingredients, listed below, to be essential in the formulation of any cleaning compounds so used. They are:

| *Ingredients* | *Quantity by Weight* |
|---|---|
| Moisture | Less than 25% |
| Alkali (as $Na_2O$) | 30 to 45% |
| Phosphates (as $P_2O_5$) | Over 20% |
| Silicates (as $SiO_2$) | Over 8% |
| Carbonates (as $CO_2$) | Less than 20% |
| Insoluble matters | Less than 1% |
| Chlorides and Sulphates | Less than 3% |
| pH | Between 10.5 and 12.0 |

From the foregoing it can be seen that the high percent of alkali (e.g. sodium metasilicate, TSP, etc.) gives good wetting, emulsifying and

## DISHWASHING PRACTICE AND EFFECTIVENESS * IN A LARGE CITY AS REVEALED BY A SURVEY OF 1,000 RESTAURANTS

by Hayman J. Kleinfeld, Ph. G. and Leon Buchbinder, Ph. D.
Bureaus of Food and Drugs and Laboratories
Department of Health, New York City

**TABLE I**

**Comparison of Findings of Utensils Washed by Hand and by Machine**

| | HAND WASHING 877 Establishments | | MACHINE WASHING 175 Establishments | |
|---|---|---|---|---|
| Utensils | % Acceptable | % Not Acceptable | % Acceptable | % Not Acceptable |
| Glasses | 10.8 | 89.2 | 51.9 | 48.1 |
| Cups | 10.0 | 90.0 | 33.0 | 67.0 |
| Spoons | 35.2 | 64.8 | 40.1 | 59.9 |
| Forks | 36.5 | 63.5 | 29.8 | 70.2 |

**TABLE II**

**Comparison by Types of Establishments of Findings on Utensils Washed by Hand and Machine**

| | HAND WASHING | | MACHINE WASHING | |
|---|---|---|---|---|
| Utensils | % Acceptable | % Not Acceptable | % Acceptable | % Not Acceptable |
| Cafeteria—113 Establishments | | | Cafeteria—57 Establishments | |
| Glasses | 5.0 | 95.0 | 31.8 | 68.2 |
| Cups | 2.8 | 97.2 | 19.0 | 81.0 |
| Spoons | 18.3 | 81.7 | 32.4 | 67.4 |
| Forks | 24.2 | 65.8 | 25.0 | 75.0 |

* A copy of this test is available in its entirety by request to the author.

| Utensils | % Acceptable | % Not Acceptable | % Acceptable | % Not Acceptable |
|---|---|---|---|---|
| Waiter Service—208 Establishments | | | Waiter Service—208 Establishments | |
| Glasses | 9.6 | 90.4 | 56.8 | 43.2 |
| Cups | 8.2 | 91.8 | 32.4 | 67.6 |
| Spoons | 36.4 | 63.6 | 37.5 | 62.5 |
| Forks | 36.4 | 63.4 | 30.0 | 70.0 |
| Luncheonette—260 Establishments | | | Luncheonette—260 Establishments | |
| Glasses | 10.2 | 89.8 | 50.0 | 50.0 |
| Cups | 8.1 | 91.9 | 46.7 | 53.3 |
| Spoons | 27.3 | 72.7 | 52.4 | 47.6 |
| Forks | 25.3 | 74.7 | 38.0 | 62.0 |

suspending power to the detergent compound and also acts as a bactericidal agent. The phosphates, especially the polyphosphates, are effective water softeners. Naturally, the concentration of these polyphosphates used depends on the degree of water hardness. Silicates are used to inhibit the corrosion of aluminum by the alkaline solution. Silicate forms a tough outer surface around the aluminum, thereby protecting the aluminum from the alkaline solution. Although no mention is made of wetting agents, synthetics are gradually being added to the formulation.

Since machine dishwashing allows the use of high temperatures for wash solutions and rinse water, essential to removing the soil from the surface of the dish and in killing bacteria, certain temperature factors should be considered. For excellent results in cleaning dishes, it is proposed* that a wash temperature of 130°F-140°F be used for the removal of the soil. Temperatures beyond 140°F cause protein (egg) and carbohydrate soils to coagulate and harden on the dishes. As a consequence, removal becomes very difficult. The time period for the wash operation may vary from 20 seconds to two minutes. A rinse period of 10 seconds at 170°F. is sufficient to effectuate proper sanitization by destroying any residual organisms. Since health codes vary throughout the country, the hotelman is advised to check with the local boards of health on wash and rinse temperatures and time intervals for washing and rinsing.

Because a small quantity of suds will form when the alkali contacts the greasy soil, it is usually advisable to pre-rinse the dish before placing it in the machine. Pre-rinsing also prevents the food particles from clogging the machine. Glassware is usually washed and pre-rinsed by hand before being run through the machine.

It is understood that no hotel was ever designed to be an experimental laboratory for dishwashing compounds. For this reason it is not expected that a particular detergent will always be used under ideal conditions, such as in a testing laboratory. The human element is too great a factor. Personnel must be trained to operate and maintain the dishwashing machine properly, before even a start can be made toward efficient cleaning. For example, the dishwashing machine and equipment should be checked periodically. Scum and scale which have become hardened to the walls of the machine must be removed. Whenever necessary the machine should be kept well lubricated.

### General Cleaning

1. *Painted Surfaces.* Strongly alkaline and abrasive detergents, though effective cleaners, will remove paint and injure the appearance of the finish. Gloss will become dulled and lusterless. Delicately tinted paints will lose color. Abrasives will scratch or etch the surface.

Although trisodium phosphate has been most commonly used in cleaning painted surfaces, its high pH (11.1) actually is too strong. So, too, with other alkalies, such as soda ash. Soap can be used, but only under conditions favoring its detergent action, otherwise lime soaps will form and will adhere as film on the surface. Because of the limitations encountered in the use of alkalies, soaps and abrasives, the newer synthetic detergents are gradually surpassing all other detergents as cleaners for painted surfaces. Being almost neutral or having a pH of approximately 10 or less, these synthetics form mild solutions and, as a consequence, are not harmful to the paint. Furthermore, only very small quantities need be used to obtain satisfactory results.

The latest government requirements for cleaning compounds to be used on painted surfaces specify that the compound must: 1. Be a synthetic detergent; 2. Contain no abrasives; 3. Contain no soap; 4.Have a pH of not less than 5.5 and not more than 10.0; 5. Give a gloss-loss of only ½ of that which is caused by trisodium phosphate (TSP).

Regardless of whether soap, alkali or synthetics are used in cleaning painted surfaces, the detergent solution gives best results when lukewarm. In fact, it is even desirable to rinse the surface thoroughly with a clean cloth moistened in lukewarm water. In addition, unless the cloth is also thoroughly rinsed before wetting it with the detergent solution, the dirt will be respread and not removed. Consequently, the soil will be redeposited on the surface, leaving it streaked.

2. *Wallpaper.* Inasmuch as water ordinarily should not be used for cleaning most wallpapers, a dry or slightly damp mixture of a glutenous substance, common salt, or borax may be used. These act to erase or absorb the dirt. Several such commercial cleaners are available, some containing abrasives. Fine abrasives accelerate scouring action and are usually not harmful unless the paper is scrubbed too vigorously. If so-called "washable" wallpaper is to be cleaned, most of the synthetic detergents will give satisfactory results in removing ordinary dirt accumulations, smudges, and fingerprints. An absolute minimum of water should be used, and rinsing should be thorough but not excessive.

3. *Porcelain and Tile.* Porcelain and tile surfaces can be marred by continuous use of cleaning compound containing harsh abrasives. Many commercial products contain such abrasives because they are cheaper than the finely ground variety and because they clean more quickly. Powdered talc, feldspar, or volcanic ash are satisfactory abrasives. In addition to these abrasives, sodium metasilicate, trisodium phosphate, sodium sesquicarbonate, modified soda ash or similar medium alkalies also are excellent. Sometimes these are added to soap solutions or synthetic detergents for better cleaning. Moderately acid solutions (as oxalic acid) are good for removing rust stains, but manufacturer's directions must be followed carefully since acid is injurious to both the hands and to the porcelain.

4. *Unfinished Wood Floors.* Use of strong solutions of soaps and alkalies and excessive quantities of water for rinsing are to be avoided since strong alkalies will eventually darken the wood and too much water will soften and warp the boards. Mopping

(*Turn to Page* 141)

* W. L. Mallmann, Leo Zaikowski and David Kahler, *A Study of Mechanical Dishwashing*, National Sanitation Foundation, October 1, 1947.

# Dodge & Olcott


Factory of Dodge & Olcott during the 1880's

THE 150th anniversary of the founding of the original firm from which developed Dodge & Olcott, Inc., New York, the oldest company in America specializing in the import of essential oils and kindred products, was marked last month by the publication of a historical booklet outlining the progress and development of the concern since 1798. The 96-page book, entitled "The Story of an Unique Institution," traces the inception of the concern as Robert Bach, at 128 Pearl Street, to the present establishment of Dodge & Olcott, a subsidiary of U. S. Industrial Chemicals, Inc., at 180 Varick Street, New York.

Bach set up his company as an "Importer of Drugs and Chemicals," and operated an "Apothecary Shop" in conjunction with the importing business. Through the years the operations of the company expanded, and today Dodge & Olcott is in the business of producing and merchandising essential oils, aromatic chemicals, perfume bases, vanilla and its derivatives, flavor bases, oleo resins, colors and paint deodorants. Dodge & Olcott's products are used in the soap, cosmetic, perfume, drug, tobacco, food, confectionery, chewing gum and soft drink industries.

The historical record gives some of the flavor of the times at the start of the Bach concern by noting that the original firm was located directly across Pearl Street from the residence of the notorious Captain Kidd, who was to be hung three years later in London.

Dodge & Olcott is unique in American business history not only for the fact that it is one of the oldest firms in the United States, but likewise because through its century and a half of continuous operation the control of the business has remained in three families—the Bachs, Dodges and Olcotts. Four other names, however, appeared in the partnership titles of the firm in the early years. These were Wheaton Bradish, Thomas W. Cumming, George D. Phelps and John Colvill. The title of the firm became Dodge & Olcott in 1861.

The original members of the families now in the firm name were Richard J. Dodge, who became associated with Bach at the age of 14, and George M. Olcott, who became a partner at the age of 22. The present chairman of the board, Francis T. Dodge, is a grandson of Richard J. Dodge. J. Waldo Booth, a grandson of Olcott, is vice president in charge of foreign sales.

The roster of Dodge & Olcott employees is heavily sprinkled with long service records. Mr. Dodge, chairman of the board, is one of those, whose name is at the top of the list, with 44 years' service. Among the 385 present employees, there are nine who have served 40 years or more, 25 with records of from 25 to 39 years, 40 from 15 to 24 years, and 38 more whose tenures extend from 10 to 14 years. Richard J. Dodge, first of the family in the company, and his son, Francis E., each gave 70 years of their lives to the concern.

Charles A. Myers, who recently resigned as president after being with the firm for 41 years, in a chapter entitled, "Sugar and Spice and All Things Nice," in the sesquicentennial booklet, describes the romance of the

FRANCIS T. DODGE
Chairman of the Board

# is 150 Years Old

Present plant of Dodge & Olcott which is located in Bayonne, N. J.

business of collecting essential oils, drugs, and spices from all parts of the globe. An early price book of the Bach company contained these items for sale: anise, clove, caraway, cinnamon, juniper, lavender, peppermint, origanum, pennyroyal, sassafras and turpentine.

Currently Dodge & Olcott offers for sale more than 3,000 items in the lines of essential oils, aromatic chemicals, tinctures, fixatives for perfumes, floral waters, resinous concentrates, balsams and gums, perfume bases, flavors and esters. It offers to the food industry such interesting flavors as carrotseed and passion fruit, as well as all the familiar flavors. D & O stocks rare and exotic bases for the perfume trade bearing equally unusual titles of "Treffle," "Rockafleur," "Piqua" and " Omar."

The history notes that beyond doubt, the most extraordinary articles handled by the company are the three animal products, Musk, Civet and Ambergris, for which the firm has been an importing headquarters for more than three-quarters of a century. Musk is obtained from a small deer found in China, Civet from the Civet cat native of Abyssinia, while Ambergris is a growth expelled by the sperm whale. The largest piece of Ambergris sent to the company, 35 years ago, weighed over 200 pounds and brought a price of $35,000 to its finders.

JOSEPH RUDOLPH, president
VALENTINE FISCHER, vice-pres.

CHARLES O. HOMAN, vice-pres.
WALDO BOOTH, vice-pres.

F. H. KIRN, treas.
B. H. YOUNG, sec't.

# TRISODIUM PHOSPHATE

**By John R. Skeen**

Market Research Department
Foster D. Snell, Inc.

THE industrial importance of trisodium phosphate has increased steadily for over 30 years and, normally, there is sufficient for all needs. Experience in two wars has shown that serious, although temporary deficits develop. In part, this is occasioned by the curtailment of the supply of fats and oils for making soap, and even, more significant, by the diversion of the raw materials to military needs. However, when hostilities end, there is trisodium phosphate and to spare and this situation has obtained for the past three years.

Although the demand for trisodium phosphate increased during the period 1941-45, it is an interesting fact that production was actually less than in preceding years. The explanation may be found in the factors influencing the supply and distribution of the necessary intermediate, phosphoric acid. This acid was first made by the "wet" process developed by the fertilizer industry. Thus, rock phosphate, located in Florida and Tennessee, is treated with sulfuric acid and the product is recovered and purified. In 1929, Victor Chemical Works began the operation of a large blast furnace which converted rock phosphate directly into phosphoric acid. Six years later the Tennessee Valley Authority placed an electric furnace in operation. The TVA furnace was capable of making the acid in one stage or of producing elemental phosphorous from which the acid and any other phosphorous-containing chemical could be made. The method as operated by the inexpensive electric power of TVA offered many economic advantages. Victor and Monsanto Chemical Co., representatives of the chemical industry, were attracted to the procedure and undertook large scale production almost immediately. These enterprises prospered and the capacity to make the element rose from 62 million pounds in 1936 to 148 million pounds five years later. Further, of the 1.3 million pounds of phosphoric acid (50 percent) made in 1941, over 45 percent was derived from elemental phosphorus.

As the war progressed, military needs increased not only for phosphoric acid and its products but also for elemental phosphorous to make signal flares and incendiary bombs. The armed forces were supplied with 196 million pounds of the element during the war. Therefore, in spite of the constantly expanding capacity, the quantity of phosphoric acid made from the element rose from 600 million pounds in 1941 to only 730 million pounds four years later. Production by the wet process did not increase at all. In this same period, the output of sodium derivatives rose from 85 to 115 million pounds. Thus, there was competition for elemental phosphorus as well as for the even more limited supply of the acid.

While many chemicals derive from phosphoric acid, those of greatest importance include sodium metaphosphate, sodium tripolyphosphate, the alkali metal pyrophosphates, the ammonia phosphates and the orthophosphates. The orthophosphates were the first to attain commercial significance and particularly in the fields of soap, metal cleaning, water softening and baking powders. The group consists of the three sodium salts, the mono-, di-, and trisodium phosphates. The first two are prepared by treating the acid with soda ash, while trisodium phosphate is made by reacting disodium phosphate with caustic soda at 90°C.

With respect to use, trisodium phosphate is most closely related to tripolyphosphate, pyrophosphate and metaphosphate. These chemicals are of greatest value as detergents and water conditioners and find many applications in such fields. However, the triphosphate was the first to attain commercial importance, beginning about 1916. At that time, the demand for sodium silicates was increased for use as a soap builder and to supply the cardboard box industry. The phosphate was, therefore, promoted as a detergent because of the relatively small production of soap and, somewhat later, it was also incorporated in soap as a builder. Value in boiler-cleaning compounds was soon recognized and, about 1920, the chemical was employed in water conditioning, particularly boiler-feed waters. New uses multiplied and trisodium phosphate was consumed as a corrosion inhibitor, paint remover, automobile radiator cleaner, degreaser for metals, component of dentifrices, and in many other ways. The major use continued to be in the detergent field, especially in combination with soap.

Other phosphate chemicals encroached upon these markets. In 1923, Monsanto first made a commercial grade of sodium pyrophosphate. Production remained small until, 11 years later, it was recognized that pyrophosphate improved the lathering properties of soap and cleaners, and was effective in the prevention of calcium deposits from water. While new markets were undoubtedly created, it is also true that sales of the pyrophosphate were at the expense of trisodium phosphate to a significant

extent. Much the same story relates also to the advent of the metaphosphate in 1930. This compound was developed by the Hall Laboratories for treating boiler waters. Manufacture consisted in sintering sodium metaphosphate with sodium hydroxide and carbonate. Upon cooling, the mass is rolled to form glass sheets which are simultaneously fragmented. In 1933, the metaphosphate was introduced as a water softener for laundries. The next year, it was mixed with trisodium phosphate and sold as a dishwashing compound. Soon after followed the uses as a soap assistant and a water conditioner (the 'threshold treatment). It is probably true that sodium metaphosphate is the most effective general water conditioner available. Price is relatively high however.

There were seven or eight makers of trisodium phosphate in the early part of the century. Three of these were fertilizer manufacturers: Virginia-Carolina Chemical Co., American Agricultural Chemical Co. (Bowker) and International Agricultural Corp. The rest were members of the chemical industry and included Victor and Warner Chemical Co. (later Westvaco Chlorine Products Co.). Production was small and intermittent. By 1925, over two million pounds were made by four producers, General Chemical Co. in its highly integrated plant at Marcus Hook, Pa., Grasselli Chemical Co. (later acquired by du Pont), American and International. Shortly after, the Blockson Chemical Co. began at Joliet, Ill. followed by American Cyanamid Co., and the A. R. Maas Chemical Co. at Los Angeles.

By 1929, the nine members of the industry felt that their competitive position in the manufacture of the chemical was most uncertain because of the rapidly mounting imports of trisodium phosphate from Germany and Belgium. For instance, from a level of 1.5 million pounds early in the decade, imports became nearly 17 million pounds in 1927. In petitioning Congress for higher tariff protection, the domestic producers claimed that the foreign product could be delivered duty paid at less than the chemical could be made in this country. As reported in the record, costs were indefinitely less than $50 per ton. At the same time, contract prices were $78 per ton. It appears that the selling price was sufficiently high to encourage foreign competition. The tariff was increased slightly, however.

Many changes followed thereafter. Markets were extended as price was reduced. The operation of furnaces employing inexpensive TVA power added greatly to the raw material supply. Corporate reorganizations were numerous. To-day the largest producers in the field are du Pont, Victor, Monsanto, American Cyanamid and American Agricultural Chemical Co. So long as the supply of fats and oils continues to be adequate, it is unlikely that there will again be a deficit of trisodium phosphate.

**TRISODIUM PHOSPHATE**

**Unit: tons**

| | Production 1 (100% basis) | Imports 2 | Exports 3 (100% basis) | Producing 4 Plants (number) | Consumption 5 soap and detergents | Price 6 $/ton |
|---|---|---|---|---|---|---|
| 1933 | 79583 | — | 505 | 11 | | 46.12 |
| 1935 | 87109 | 30 | 462 | 14 | | 47.12 |
| 1937 | 117402 | 6 | 381 | 13 | 39500 | 37.28 |
| 1939 | 116731 | 39 | 579 | 12 | | 40.96 |
| 1941 | 86315 | 46 | 627 | | 71000 | 48.56 |
| 1942 | 70821 | 17 | 743 | | | 54.00 |
| 1943 | 72632 | 2 | 640 | 11 | 60400 | 54.00 |
| 1944 | 80291 | — | 832 | | | 54.00 |
| 1945 | 88731 | — | 738 | 9 | | 54.00 |
| 1946 | 94963 | — | 1082 | 9 | 75000 | 54.00 |
| 1947 | 89055 | 121 | 1349 | 9 | | 69.16 |
| 1948,1Q | 21229 | — | 463 | | | 68.25 |
| 2Q | 17652 | — | 548 | | | 69.00 |

1 1933-37: *Census of Manufactures*, "produced for sale"; 1939-45; *Facts for Industry*, 1946 —: ibid, monthly reports; total production.

2 1934-36: entries through port of N. Y. reported by Tariff Commission— 1934, 24.3 tons; 1935, 29.9 tons; 1936, 67.1 tons; these represent close approximations to total imports of trisodium phosphate; otherwise, imports reported by *Foreign Commerce & Navigation* through 1945; thereafter, *Monthly Summary of Foreign Commerce of the U. S.*; these sources include all the sodium phosphates excepting 1944 and after.

3 Exports are not reported for 100% trisodium phosphate except for 1944, *Facts for Industry*, series 6-8-22; values given here are approximations only and represent 13% of exports as reported for all years (excepting 1944); for references, see (2): 1935 and before, mono-, di- and trisodium phosphate; after 1935 all sodium phosphates are included.

4 1939 and before: reported by *Census of Manufacturers*, also House *Tariff Hearings*, 1929; after 1939: *Facts for Industry*, series 6-1, and M 19A supplements.

5 1937: Bureau of the Census, includes the three ortho phosphates; 1941: "informed opinion," WPB, unofficial; usage in 1943 was about 85% that of 1941 and in these years 70% derived from wet process and about 30% from elemental phosphorus; 1945: estimate only as based upon a survey made 1945.

6 Bureau of Labor Statistics; 1933-43: bags, c.l., f.o.b. works, 1944 —: works, freight equalized. 1937: Bureau of the Census, includes the three ortho phosphates; 1941: "informed opinion,"

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The distinction between "apparent cleaning" and "cleaning maintenance," defined as work schedule in which sufficient time is provided for the cleaning of all items of finish and equipment to consistently maintain the item at a high standard of cleanliness at all times, is discussed in a recent article in the August issue of *Buildings* magazine. The article, entitled "A Man-Hour Guide to Cleaning Efficiency" by George R. Bailey of Albert H. Wetten & Co., Chicago, defines what constitutes a high standard of cleaning and is illustrated with a cleaning work schedule chart. The chart provides a specification of cleaning for a typical commercial office building.

Another article in the same issue, also based on a talk before the recent Boston convention of the National Association of Building Owners and Managers, bears the title, "A New Approach to Cleaning." In it the author discusses the scheduling of cleaning work so as to reduce spiraling costs. The new system introduced by the author was based not on square feet of floor space in allocating cleaning time, but on number of units to be cleaned.

# NEW PRODUCTS

*New Packages*


Novel packaging for a new shampoo product has been achieved by Gene Rose, Inc., Dayton, O., using plastic bottles that can be squeezed to dispense liquid creme hair and body shampoos. Bottles are in pink and green. Both the large and small plastic tops are removable for filling.


Above: "Hydrol Prophylactic Soap," a germicidal type soap made by Hydrol Chemical Co., Philadelphia, now comes packed in modernized eight - ounce container bottle produced by Owens-Illinois Glass Co., Toledo. The prophylactic soap, on the market for about 20 years, but available only to embalmers, will be distributed to doctors, hospitals, hotels, and similar types of users.

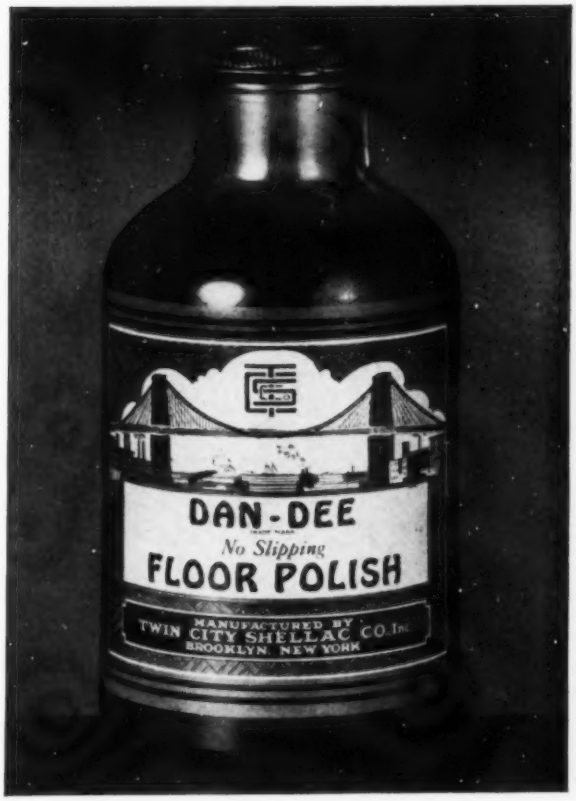
Below: Soap in three different sizes is part of the new "Golden Chance" line of cosmetics and toiletries produced by Harriet Hubbard Ayer, Inc., New York. Hand size, top left, retails for $1.50 for box of three. Bath cakes (top, right) retail three cakes for $2.25 and guest size, six to a box, center foreground, retails for $2.00.

The dentifrice (below) is one of the new products in the line of toiletries and cosmetics sold by house-to-house representatives of Avon Allied Products, Inc., New York. Product is to retail for 43 cents, and supplements older tooth paste in line.



(Above) New "Dubarry" gift box for Christmas designed by Richard Hudnut, New York, features large cake of bath soap. Dusting powder in plastic box and cologne are other two components of set which retails for $5.50 plus tax. Pink and gold striped box is topped with DuBarry rose.

Below: "Dan-Dee" floor polish produced by Twin City Shellac Co., Brooklyn, is now available in a convenient glass container with gold color label. Glass container is round, stock mold, quart bottle made by Owens-Illinois Glass Co., Toledo.




Single moving part in new dispenser, below, made by Central Products Co., Chicago, measures uniform quantity of granulated, bead or powdered soap. The part dispenses soap and returns to loading position as pressure on operating lever is released. Contents are said to be agitated each time dispenser is used.

The Bettmann Archive

# Easy as knowing how...

Knowing how is simply the sum of experience, resources and imagination, put into the job of doing something better.

Niagara Alkali Company pioneered the electro-chemical industry in America. Niagara continues to extend the know-how gained in this pioneering work to the many users of Niagara Caustic Soda, Caustic Potash, Carbonate of Potash, EBG Liquid Chlorine, Paradichlorobenzene and Niagathal (Tetrachloro Phthalic Anhydride). May we serve you?

**NIAGARA ALKALI COMPANY**

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JQUID CHLORINE • CAUSTIC POTASH • CARBONATE OF POTASH • PARADICHLOROBENZENE • CAUSTIC SODA • NIAGATHAL (TETRACHLORO PHTHALIC ANHYDRIDE)

# TRADE NEWS

## Bon Ami "Gloss Glass" Bows

Bon Ami Co., New York, recently announced the addition to its line of "Gloss Glass," a new wax-like cleaner for metal, glass, etc. The new product supplements, but does not replace, "Bon Ami Powder" and "Bon Ami Cake." Introduction of "Gloss Glass" is expected to take place shortly on the Pacific Coast and in Texas, where it will be promoted with radio and newspaper advertising. Main emphasis in promoting the product will be on its glass and silver cleaning effectiveness, although its value in removing dirt, tarnish and discoloration from chromium, nickel and other metals, from enamel and tiling and other surfaces will also be featured.

## In New Pepsodent Post

Lever Brothers Co., Cambridge, Mass., reecntly appointed W. Gardner Barker as director of new products in the firm's Pepsodent Division, Chicago. He was formerly market exploitation manager for Lever. The newly created department, which Mr. Barker has been named to head, will be charged with supervision of recently acquired additions to the Pepsodent line as will as to aid in the development of new products.

## C-P-P World Sales Up

Although its world-wide sales for the third quarter of this year were greater than those of the comparable 1947 quarter, total sales for the first nine months of this year were below those of a year ago, E. H. Little, president of Colgate-Palmolive-Peet Co., Jersey, City N.J., reported recently. World-wide sales for the third quarter amounted to $80,242,569 in 1948, while a year ago in the like quarter they were $78,264,216. Domestic sales and earnings for the first nine months of 1948 amounted to $171,069,831, equal to $4.03 per common share ($59,271,534, equal to $1.52 for the third quarter); as against $192,520,092, equal to $7.40 for the first nine months of 1947 and $60,213,381 worth $2.62 for the third 1947 quarter.

## New P. & G. President

Neil H. McElroy, above, Procter & Gamble Company's new president, has been with the firm since 1925. For full details on his advancement and other changes see story on page 53.

## Italy Honors Luckman

Charles Luckman, president of Lever Brothers Co., Cambridge, Mass., and former head of President Truman's citizens food committee, was recently awarded Italy's star of solidarity. Foreign Minister Carlo Sforza pinned the decoration on Mr. Luckman, in Rome, Oct. 15.

## Armour Credit Man Dies

William Olson, a credit man in the soap division of Armour & Co., Chicago, for 30 years, died Sept. 27.

## Lever Names Pierce

Thomas W. Pierce was recently named sales manager of the Atlanta division of Lever Brothers Co., Cambridge, Mass. He is supervising the concern's sales in Georgia, Florida, Northern Mississippi, Tennessee and the Carolinas.

## Acquires Modern Chemical

Lavery & Sanders, Philadelphia, recently acquired Modern Chemical Co., which will be operated as a subsidiary of Lavery & Sanders at its Philadelphia factory, Montgomery at Delaware Ave. Modern Chemical Co. manufactured "Kleenal" car wash, one of the first powdered car washes on the market. The product will continue to be marketed through the jobbing trade under the new set up.

## Market Surveys on Soap

Consumer analyses showing soap, cleaning material and related chemical specialty buying habits and brand preferences of consumers in the marketing areas of Spokane and Seattle, Wash.; St. Paul; and Sacramento, Fresno and Modesto, Calif. were compiled recently. They are available from the following newspapers or publishing organizations in those areas: *Spokesman-Review* and *Spokane Daily Chronicle* for Spokane; *Seattle Times* for Seattle; St. Paul Dispatch-Pioneer Press for St. Paul; and McClatchy Newspapers, Sacramento, for Sacramento, Fresno and Modesto, Calif.

## P&G Earnings Show Rise

Procter & Gamble Co., Cincinnati, reported an increased net profit and higher earnings for the third quarter, 1948, than in the 1947 quarter. P. & G.'s net rose from $9,014,575 (worth $1.40) for the 1947 third quarter to $13,221,906 (worth $2.05) for the quarter ended Sept., 1948.

## New Waterless Cleaner

Schaffner Industries, Inc., Pittsburgh, recently introduced a new waterless cleaner that is claimed removes a number of different types of soil in one application. The new product is known as "Little Doc Disolvit." Types of soil the maker claims the product will remove include paint, rubber cement, lipstick, tar, etc.

### New Jet Cleaner

A new, mobile "Hi-Pressure Jet Cleaner" for use in a variety of industrial, food and processing plants for removing process residues, slime, dirt, oil sludges and similar matter was announced recently by Sellers Injector Corp., Philadelphia. The cleaner has a self-contained 50-gallon tank for a detergent, a 50-foot pressure-type hose and nozzle with operating controls for various cleaning jobs. Only connections to steam and water lines are required and there are no moving parts. Jet pressure is adjustable up to approximately double the initial steam pressure. Both temperature and amount of detergent are also adjustable.

### Two C-P-P Contests

Two new contests, one for consumers and another for all retail store employees selling the company's products were announced recently by Colgate-Palmolive-Peet Co., Jersey City, N. J. The consumer contest, known as the "Palmolive Soap Treasure Chest Contest," features a first prize of $100 a month for life or $25,000 in a lump sum. In the retail store contest the writer of the best letter in 100 words or less on "How the Colgate-Palmolive-Peet Company Can Sell More Soap Products Through Retail Stores" will receive a new Ford car.

### Auto-Chlor Seeks Reps.

Exclusive representation on a franchise basis in territories still open for the sale of its method for mixing detergent and sanitizing solutions for hand dish washing was offered recently by Auto-Chlor System, Inc., Memphis, Tenn. The company calls attention to the fact that the business is especially adaptable to persons selling the restaurant and bar trade.

### Struhs Joins Aroscent

Harry W. Struhs, for the past 25 years connected with Procter & Gamble Co., Cincinnati, in various eastern posts, last month joined the sales staff of Aroscent, Inc., recently reorganized subsidiary of Davis & Lawrence Co. of Dobbs Ferry, N. Y. He was a sales manager of the New York, New Jersey, Pennsylvania and New England teritory for P. & G.

James J. Curley, formerly of Magnus, Mabee and Reynard, Inc., New York, and Julian M. Laub, previously with an engineering firm serving the cosmetic industry have also joined Aroscent, according to a recent announcement. The company states that it is planning to expand its sales organization in the U. S. and throughout the world. Plans to expand the company's factilities at Dobbs Ferry are also under way.

### Luedke Joins Pepsodent

W. J. Luedke recently resigned as advertising manager of the O'Cedar Corp., Chicago, to accept a position as assistant advertising manager with the Pepsodent Division of Lever Brothers Co. in Chicago.

**The special case (below) that opens up into a complete self-merchandising floor display and display card and window streamer was developed by Dif Corp., Garwood, N. J. for their 5 cent sales on "Dif." Customers get one box of "Dif" for 5 cents with each two packages purchased at regular retail price.**


### Kroger Soap Contest

To each of three persons named as winners in each of four contests currently being promoted by soap manufacturers, and four others conducted by food products, the Kroger Grocery chain is now offering free food for one year, with a value of $1,200. Entrants in the several soap and food contests must get their box tops at a Kroger store and write the name and address of that store on their entry blanks. After picking the winners of their own respective soap or food contests, judges sort out the entry blanks bearing the Kroger name and pick from these the three best Kroger winners.

Soap contests covered by the Kroger offer include those for "Super Suds," "Oxydol," "Palmolive" and six Lever Brothers' products. Total value of all prizes available for these and the four food products is given in Kroger advertisements as $450,000, plus $28,000 worth of food.

### Package Mchy. Mfrs. Meet

The following officers were elected by the Packaging Machinery Manufacturers Institute at its sixteenth annual meeting at the Roosevelt Hotel, New York, Oct. 12-13: President, H. Kirke Becker, Peters Machinery Co., Chicago; vice-presidents, John P. Corley, Miller Wrapping & Sealing Machine Co., Chicago, and Edward G. Kuhn, Consolidated Packing Machinery Corp., Buffalo.

The group will hold its spring meeting May 9, 1949 at the Hotel Dennis, Atlantic City, N. J.

### Lueders Expands in Canada

The acquisition of a four story building at 365 Place Royal, Montreal, Canada, was announced recently by George Lueders & Co. (of Canada). The firm, which has been operating for 35 years in Canada, will occupy the entire building. Additional laboratory equipment and increased warehouse accomodations are provided in the new location.

### Danco Relocates

Removal of Gerard J. Danco, Inc., to new offices at 5 E. 19th St., New York 3, was announced recently.

## P. & G. Names Several New Executives

THREE new-vice-presidents and a director were elected by Procter & Gamble Co., Cincinnati, last month, when it was also announced that Neil H. McElroy had been chosen president to succeed Richard R. Deupree, who became chairman of the board.

The three additional vice-presidents, elected by the board, which also reelected the other officers of the firm, are John G. Pleasants, director of manufacture, who becomes vice-president in charge of manufacturing; Howard J. Morgens, formerly manager of the advertising department, now vice-president in charge of advertising; and Walter L. Lingle, Jr., new vice-president in charge of overseas operations. He was previously manager of the overseas division. The new director is Reuben B. Robertson, Jr., executive vice-president of Champion Paper & Fibre Co., Hamilton, O., who succeeds the late George Dent Crabbs on the board.

P. & G.'s new president, who celebrated his 44th birthday Oct. 30th, has been with the company all of his working life. He joined P. & G. upon his graduation in 1925 from Harvard, where he received an A. B. degree. Prior to his election as president, Mr. McElroy was vice-president and general manager of the company, a post to which he had been appointed in 1946.

John G. Pleasants, new vice-president in charge of manufacturing, has been with Procter & Gamble since 1933, when he joined the company's oil processing department at the Long Beach (Calif). plant. Subsequently, he advanced through various technical departments, becoming plant superintendent at New York and Baltimore and division superintendent at Cincinnati in 1946. Shortly thereafter, he was appointed director of technical divisions and, in 1947, director of manufacture. He holds a Ph. D. degree in electrical engineering from the California Institute of Technology.

RICHARD R. DEUPREE

The new vice-president in charge of advertising, Howard J. Morgens, became associated with P. & G. as a salesman, in 1933, in Kansas City. Later, he switched to the advertising and promotion department, rose through brand advertising, promotion and copy supervision for grocery and toiletry products to the post of brand promotion manager. In 1946, he was named manager of the advertising department.

Walter L. Lingle, Jr., manager of the company's newly organized over-seas division since 1947, went with P. & G.'s advertising department in 1931 to do media work. In 1934, he became a salesman, after which he did brand promotion and advertising, finally becoming advertising manager of toiletries. In 1945, he was appointed managing director of the company's subsidiary in England.

In his report to the shareholders, R. R. Deupree, newly elevated chairman of the board, stated that business during the past year for P. & G. has been good. Mr. Deupree stated that the company's two synthetic detergents ("Tide" and "Dreft") hold "leading positions among products in this class." He also explained the company's program of plant improvement that will result in modern P. & G. plants strategically located across the U. S. Mr. Deupree further revealed in his report that last July the company had loans at the banks totaling close to $25,000,000, a good part of which represented the purchase price of thousands of tons of uncrushed cottonseeds and soybeans as well as other high-cost inventories. As a reserve against a sharp inventory price decline the company had set aside $37,000,000 as of June 30, Mr. Deupree reported.

J. G. PLEASANTS

H. J. MORGANS

W. L. LINGLE

### Miss Rosa Kroog Dies

Miss Rosa Kroog, for 52 years an employee of George Lueders & Co., New York, until her retirement two years ago, died Oct. 25, in Brooklyn. She joined the firm in Nov., 1894, as the first woman employee and remained until her retirement in Sept., 1946. Her 50th anniversary with the company was celebrated Nov. 12, 1944 with a banquet at the Hotel Astor, New York, at which all officers of the company and approximately 100 employees were present.

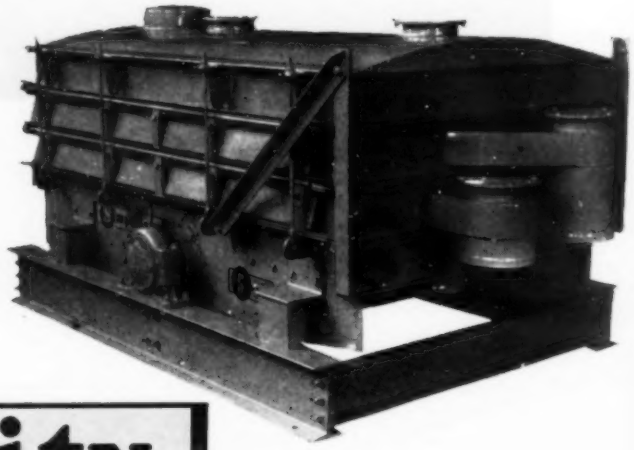
### Variety Stores Show

The National Association of Variety Stores, a trade organization of independent retailers, will hold its annual convention and seventh Merchandise Fair at the La Salle Hotel Chicago, Jan. 31-Feb. 2, 1949. In addition to merchandise exhibits there will be daily forums on prices, supply and merchandising.

# "EXCELLENT RESULTS... installing more Simplicity Screens"

Successful operation of Simplicity Screens by two of the world's largest soap manufacturers resulted in orders for more Simplicity units. In one operation in which results were available, tests showed a capacity of 1,008 pounds of soap per square foot of screening area per hour. Due to the effective screen action, the balled tailings passing over the screen were reduced to only 4% of the total feed. Again, Simplicity Screens prove their versatility and efficiency on another unusual job.

**If you have a screening problem, our Simplicity Sales Engineers can give you an answer—a profitable answer.**



**• Sales Representatives in all parts of U.S.A. • For Canada: • Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario • For Export: Brown & Sites, 50 Church St., New York 7.**

**Simplicity**
TRADE MARK REGISTERED

**SIMPLICITY ENGINEERING CO.**
Durand Michigan


**Right: Plant of Felton Chemical Co., Brooklyn which is marking its 25th anniversary. Inset shows new Los Angeles, Calif., branch plant. In connection with the celebration of its 25th year, Felton recently completed a five year program of expansion, which concluded with the occupation of the Los Angeles plant. Only recently Felton erected at its Brooklyn plant at 599 Johnsen Ave., a four-story, steel and brick structure with an interior completely finished in glazed tile. The company maintains executive offices at the Johnsen Ave. plant. Present officers and directors of the company include Dr. Joseph Felton, president, Louis Gampert, vice-president; Sophie Felton, secretary and treasurer. The firm maintains offices and stocks in Boston, Philadelphia, Chicago, St. Louis, San Francisco, Toronto and a factory in Montreal.**

## Speaks on Premiums

David B. Pickering, premium buyer for Colgate-Palmolive-Peet Co., Jersey City, N. J., spoke at the Oct. 14 meeting of the New York Premium Association, held at the Hotel Sheraton.

## Lever Man to Agency

Robert O. Smith, formerly division sales manager in Atlanta for Lever Brothers Co., Cambridge, Mass., recently joined the New York advertising agency of Benton & Bowles to handle the merchandising phase of "Maxwell House" coffee.

## Cowles Sells Wing Co.

Cowles Chemical Co., Cleveland, recently announced the sale of its Mitchell Wing Co. Division of Cambridge, Mass. to Carman & Co., New York. The sale includes the transfer to Carman of the assets and good will of the Wing division. Carman & Co. has consolidated Mitchell Wing Co. and Carman Woodley Co. under the new name, Carman Mitchell Wing Co., with offices at 33 Norfolk St., Boston. Carman Mitchell Wing Co. will act as distributor in New England for the complete line of washroom products made by Cowles. James Woolley and William Arnold, formerly of the Cowles' Wing division, have joined the new firm. D. C Knapp, manager of Mitchell Wing Co. for the past several years, has joined the sales staff of Cowles Chemical Co. as eastern representative in the heavy chemical department.

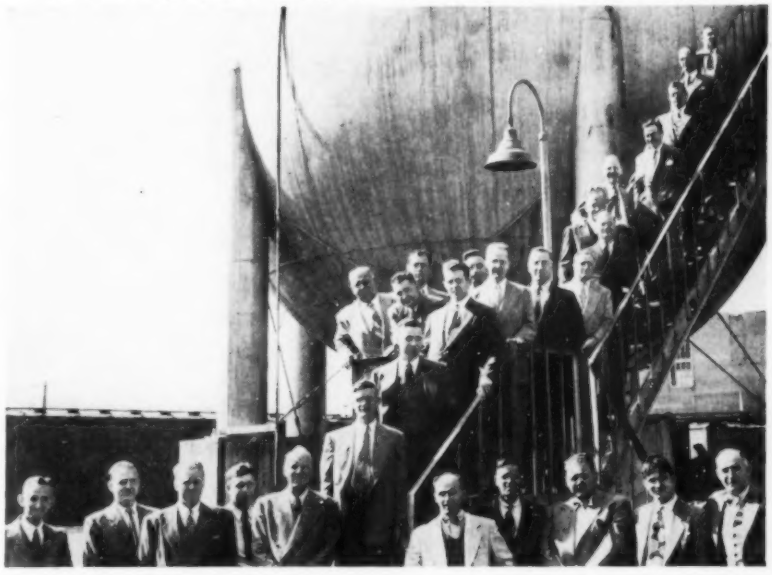
## Explosion at C-P-P Plant

An explosion at the Colgate-Palmolive-Peet Co. plant in Kansas City, Kansas, took place on Oct. 29, when a 70,000-gallon fuel storage tank blew up. The blast, which was followed by a fire, resulted in damage to the tank and its contents, estimated at $20,000. No one was injured, although a two-ton lid of the tank was hurled more than 150 feet.

## New Kiefer Chi. Reps.

Karl Kiefer Machine Co., Cincinnati, recently appointed Burnard C. York Packaging Machinery, Chicago, as its representative in Illinois, Wisconsin and Minnesota. Assisting Mr. York in representing the Kiefer line of bottling and packaging equipment is Walter Kruse.

**Above: A group of salesmen visiting the plant of the Michigan Alkali Division of Wyandotte Chemical Corp., Wyandotte, Mich., during the firm's recent annual general sales meeting. Following plant tours, the meeting was transferred to the St. Clair Inn, where a two-day round table discussion of sales took place.**



# New Soap Products at Chicago Toiletries Show

A NUMBER of new gift and standard stock soap products were shown for the first time at the sixth annual toilet goods show, sponsored by the Chicago Associated Toiletries Salesmen, held last month at the Palmer House, Chicago. Nearly 100 manufacturers and distributors had exhibits which filled 86 rooms at the hotel.

Registration of buyers was larger than in any previous year, Frank Manning of Ciro, Inc., and president of the salesmen's association, stated. Buyers came principally from midwestern states but some were from San Francisco and Los Angeles. Interest in holiday goods was strong, although buyers were also intent on general restocking of inventories, which were reported as running low.

One feature contributing much to the show's success, Mr. Manning said, was the fact that purchasers immediately confirmed their orders, an indication that they had come to Chicago with their minds made up.

All phases of the toiletries industry were represented in the displays, from perfumes, cosmetics and soaps to beauty kits, containers, dispensers and accessories of every type. Packaging for the Christmas market was much in evidence with a trend to quiet elegance in design, and materials, convenient sizes and moderate prices. Bubble bath preparations appeared more in evidence than at the previous Chicago toiletries shows and several soap manufacturers presented new lines of novelty soap designs for the juvenile trade.

Hewitt Soap Co., Dayton, O., showed their varied lines of toilet soaps at wide price ranges for drug and department store markets and talked to interested visitors about their private brand production service. Among new items was a bath crystal "By Hewitt," packed in plastic bags and a new novelty juvenile soap cake in the shape of a motor car, to retail for 10 cents. In charge was Maurice Gleason of the sales division at Dayton, O., assisted by Robert Clapp, Chicago representative.

Milkmaid Cosmetics, New York, had an attractive gift soap package wrapped in varicolored foil paper, with ribbons and bells. After suspending national advertising for three years, the company has just resumed consumer advertising in three general circulation magazines as well as to dealers in two trade journals, Miss Eunice Hoefner, who was in charge, said. Assisting her was Miss Anne Mulhern. Victor Kirker, vice-president, was also on hand.

Allen B. Wrisley Co., Chicago, had several new soap items, including a "Corsage by Wrisley" of either rose or gardenia floral design and fragrance, packed in a transparent plastic gift carton. Wrisley's "Bath Superbe" was also offered in a new holiday package for the first time since the war. Production of soap novelties has also been resumed, new items including a four-piece zoo set, a farmyard set, various clown designs, etc. To promote bulk soap sales, twelve cakes of Wrisley toilet soaps are being offered in a plastic reusable refrigerator bag. L. N. Wrisley, sales manager, directed the presentation, assisted by A. R. Kopan, Paul Litkowski and A. R. Sergeant.

The House for Men, Chicago, displayed a 24-carat gold plated glass container for after-shave preparations. The bottle, moderately priced, is intended as a companion to the company's famous solid gold shaving bowl, introduced several years ago. Its design follows the lines of the grotesque male torso container with sure-grip feature, used for other House For Men products.

Another new container was a single unit, clear glass bottle for the "Paragon" series of ten shaving preparations, carrying the trade mark "His", which had been designed two years ago, but is only now being presented to the trade. Among new items in this "Paragon" series are a "pre-electric" shave powder and an "after electric" shave lotion. Visitors received a copy of a 16-page booklet on "Good Grooming," filled with historic lore on beards and tips on modern trends in the "fine art of shaving." In charge of the exhibit, with a large staff of assistants, was Charles S. Cameron of the sales department.

Monogram Soap Co., Hollywood, Calif., with S. Greenblatt, proprietor, in charge, displayed their monogrammed castile soaps for adults and a juvenile line, carrying Walt Disney illustrations in color. The juvenile line has been on the market for 16 of the company's 25 years in business. The designs made by a special process, remain intact until the soap is consumed, Mr. Greenblatt said.

Old South Toiletries, represented by Elias Shaker & Co., showed a full line of "Old South" soaps and related items, to which have been added recently a new "Star Fire" series of seven items and an "A Propos" series, both in attractive luxury package designs.

Ferd Mulhens, Inc., New York, exhibited a new "Sir" soap for men packaged two large bars to the box. Also shown was a new assorted gift package of superfatted toilet and bath soaps. Several new fragrances are now available in the various "4711" brands of superfatted hand milled toilet soaps, M. B. Simpson, company representative, said. Prominently displayed were cologne bottles in quart size, whose wicker wrappers, like those of rare wines, date from the company's beginning in the Napoleonic era, over 125 years ago, and still have strong sales appeal.

Lightfoot, Schultz & Co., New York, played up the return of their "Ball and Chain" number to their line of novelty soap designs, and also showed numerous juvenile designs at popular prices. Details of a special promotion for "Aviderma" dry skin soap were explained to visitors by Marshall B. Houck, sales manager, Jay Salamon, and other assistants.

**SHELL CHEMICAL now synthesizes**

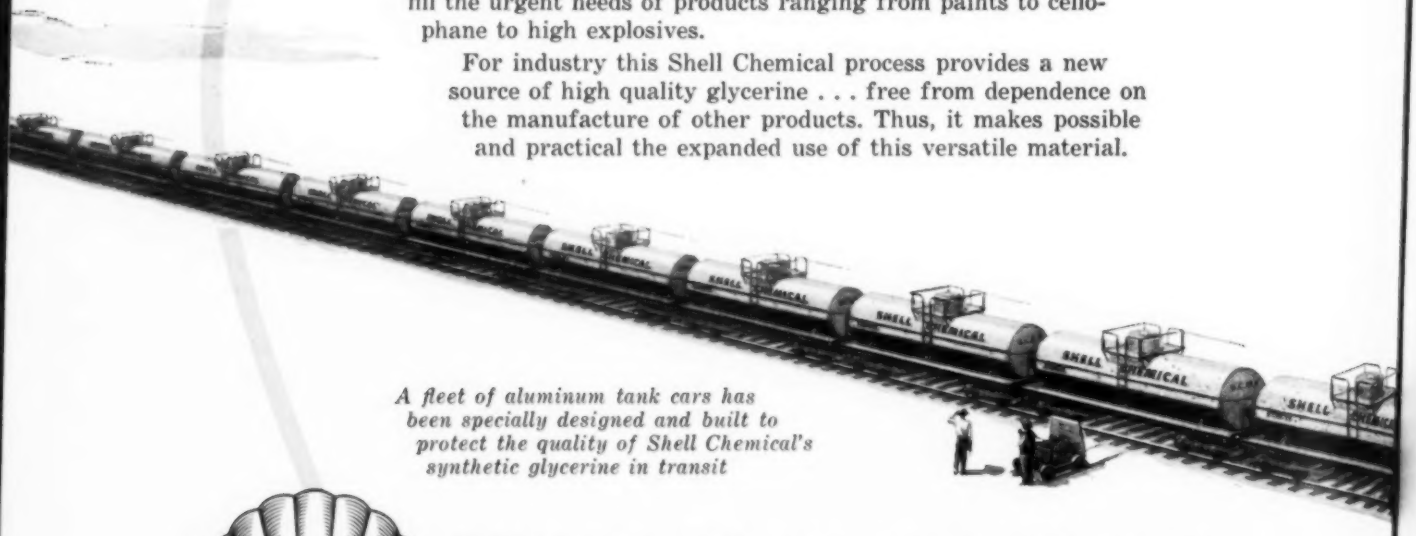
# Glycerine

## ...in quantity

A unique Shell Chemical process is now used to *synthesize* glycerine! Springing from years of fundamental research, the process is based on a chemical reaction long thought to be impossible . . . the chlorination of propylene gas to form allyl chloride. Its raw materials are plentiful—chlorine, caustic soda, propylene. And its result is glycerine of the highest quality.

The plant is now on stream at Houston, Texas, producing and shipping tank car quantities of glycerine . . . helping to fill the urgent needs of products ranging from paints to cellophane to high explosives.

For industry this Shell Chemical process provides a new source of high quality glycerine . . . free from dependence on the manufacture of other products. Thus, it makes possible and practical the expanded use of this versatile material.




*A fleet of aluminum tank cars has been specially designed and built to protect the quality of Shell Chemical's synthetic glycerine in transit*

**SHELL CHEMICAL CORPORATION**

Eastern Division
500 Fifth Avenue, New York 18 • 100 Bush Street, San Francisco 6
Western Division

Los Angeles • Houston • St. Louis • Chicago • Cleveland • Boston • Detroit • Newark

Daggett & Ramsdell, Inc., New York, had several new gift packages of men's soaps in mountain heather and pine scents, along with their extensive line of beauty creams. Frank Hudson, Chicago, in charge.

Schratz Products, Detroit, Mich., which has been in business since 1888, is one of the oldest bubble bath producers in the country, according to M. B. Feldman, proprietor. Luxury bath preparations of every type except soap, were featured, including "Tublets," a concentrated bath oil, which the company claims to have originated. Mrs. Feldman assisted her husband as hostess at the booth.

Among other outstanding exhibitors of bubble bath items were Deluxabath, Chicago, and Trylon Products Corp., Chicago. Lanchere, Inc., also displayed greaseless bath agates in various fragrances and bubble bath crystals, along with lanolated soaps and other cosmetic preparations.

Tischer Cosmetics, Chicago, featured a new deodorant stick in a plastic tube with movable bottom, to be pushed up as the cream-like preparation is consumed. Invented by Miss Venetta Tischer, the proprietor, to fill a feminine need, the idea, it was also pointed out, is adapted to men's shaving sticks.

### Chi. Soap Saving Seen

If 10 suburban communities on Chicago's south side were to start using the soft water of Lake Michigan instead of hard well water, as at present, their citizens would save $196,612 a year on soap, according to Loran D. Gayton, Chicago city engineer. In Chicago Heights, where the local water supply is hardest, citizens would save about $6.44 each on their soap bills, Gayton estimated, while in another nearby community, where the water is not so hard, the saving would be $3.43 per person. The report was made in connection with a study by the Chicago public works department, to determine how much to charge the southern suburbs, if plans are consummated to supply those communities with water from the Chicago municipal water system.


**The 1948 model of the "Food-O-Mat" dispenser shown above was installed recently at Grand Union Co. grocery store in Union, N. J. The new model features maximum visibility of product and label. Packages are put in at rear of "Food-O-Mat" and slide into place with the label side up. Food-O-Mat Corp. is the maker.**

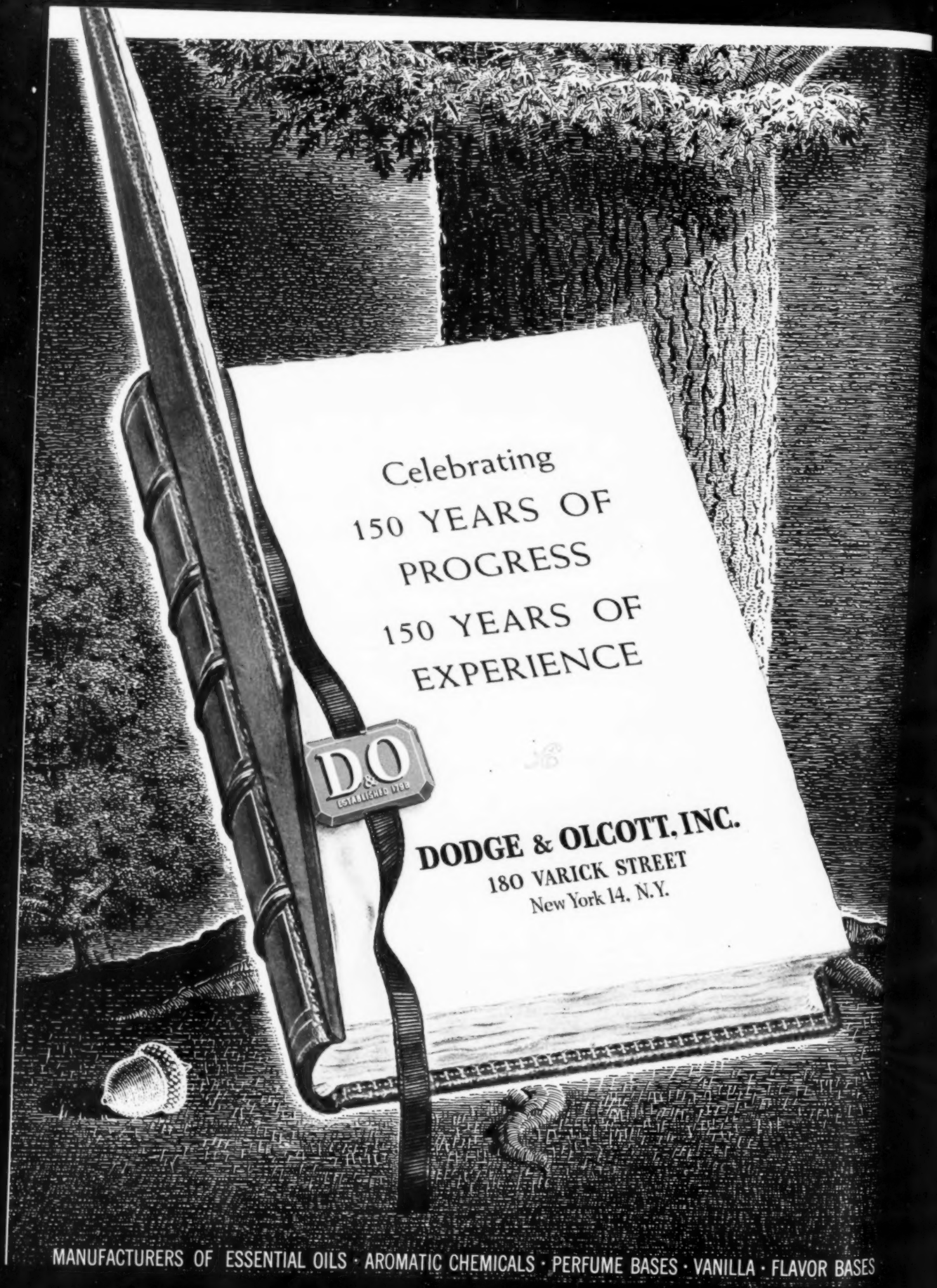
### Builds New Soap Plant

Far Best Corp., Los Angeles, is erecting a new soap factory building at 6715 McKinley Ave. The structure, which is being erected by Nance Construction Co., Los Angeles, will cover an area of 30 x 50 feet and will cost $5,500.

## P. & G. Introduces "TIDE" In New York

"TIDE," Procter & Gamble's newest washing powder in synthetic detergent form for the family wash was introduced at a press luncheon at the Hotel Pierre, New York, Oct. 14. Although the product has been distributed in the middle west for two years, its introduction to the New York marketing area is expected shortly. David Byerly, chemist for P. & G., spoke about the product and demonstrated it at the luncheon. "Tide," for heavy duty washing purposes, supplements an earlier P. & G. synthetic, "Dreft," which was designed for lighter duty laundering.

Mr. Byerly in his talk explained that few improvements had been made in soaps up until the last 30 years. He mentioned the introduction of beads, flakes and chips as advances that have been made in soaps. He also mentioned changes in formulations of soaps for specific purposes as an illustration of progress in the industry. The need for a more effective washing material than soap, particularly in hard water areas, led to the development of the synthetics, which perform even better in hard water than soft water, Mr. Byerly pointed out. He mentioned "Dreft" as being the first of the synthetics. It was brought out in 1934. However, the need for a product that would clean heavily soiled cotton clothes still continued and for this reason research work continued and resulted in "Tide." The newest Procter & Gamble detergent was extensively tested in the company's experimental home laundry and later given to housewives in unmarked packages for testing. Later it was tried out in test markets, particularly in the hard water areas of the middle west, where it has been sold for about the past two years. "Tide" is now distributed everywhere but in the region east of the Hudson River, and will be sold in this area within the next few months.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150 YEARS OF
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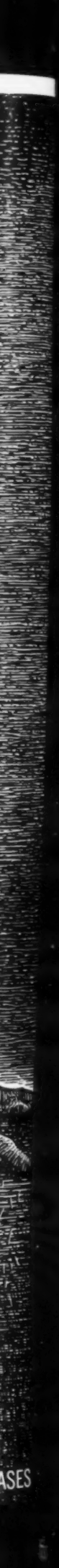
New York 14, N.Y.
MANUFACTURERS OF ESSENTIAL OILS · AROMATIC CHEMICALS · PERFUME BASES · VANILLA · FLAVOR BASES



# BIDS AND AWARDS

## Treas. Floor Wax Bids

In a recent opening for miscellaneous supplies by the Federal Bureau of Supplies, U. S. Treasury Department, Washington, D. C., the following bids were received on 6,050 gallons of floor wax: Trio Chemical Works, Brooklyn, 46 cents; Continental Car-Na-Var Corp., Riverdale Heights, Md., $2.26; G. & G. Paint Co., Washington, D. C., $1.31; Beacon Co., Boston, $1.20; Windsor Wax Co., Hoboken, N. J., 58 cents; S. C. Johnson & Sons Co., Racine, Wis., $1.32; R. M. Hollingshead Corp., Camden, N. J., 54 cents; American Products Co., Reidsville, N. C., 39.75 cents; Penetone Co., Tenafly, N. J., 54 cents; Fuller Brush Co., Hartford, Conn., $1.40; Liquid Veneer Corp., Washington, D. C., 90 cents; Continental Car-Na-Var Corp., Brazil, Ind., $1.65; Joseph E. Frankle Co., Philadelphia, 61 cents; Twin-City Shellac Co., Brooklyn, 65 cents; Wilbert Products Co., New York, 74 cents; Lasting Products Co., Baltimore, 72 cents; Old Dominion Paper Co., Norfolk, Va., $1.1319; Oil Specialties & Refining Co., Brooklyn, 66.1 cents; Buckingham Wax Co., Long Island City, N.Y., 59.8 cents; Ches-White Co., Baltimore, 58 cents; Hughes Chemical Supply Co., Baltimore, 73.4 cents; Midland Laboratories, Dubuque, Ia., $2.15; Davies-Young Soap Co., Dayton, O., 82 cents; Huntington Laboratories, Huntington, Ind., $1.15; New Jersey Chemical Co., Bayonne, N. J., $1.21; John C. Stalfort & Sons, Baltimore, 89.8 cents.

## Sweeping Compound Bids

Bids on 26,000 pounds of sweeping compound were received in a recent opening for miscellaneous supplies by the Bureau of Federal Supply, Treasury Department, Washington, D. C.: Michigan Sweeping Compound Co., Detroit, three cents in 70-pound metal drums; Paxson Manufacturing Co., Philadelphia, 2.8 cents; A.M.R. Chemical Co., Brooklyn, 2.75 cents; New Jersey Chemical Co., Bayonne, N. J., 2.19 cents; Cotterel Co., Harrisburg, Pa., $2.96 per hundred pounds; Buffalo Sweeping Compoud Co., Buffalo, N. Y., $2.30 per hundred pounds; Banner Chemical Products Co., Newark, N. J., 2.2 cents; Worth Spar Co., Middletown, Conn., 2.5 cents, alternate in 50-pound lined burlap bags.

## P.O. Grit Soap Bids

The following bids were received on 6,000 pounds of grit cake soap in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C.: Unity Sanitary Supply Co., New York, 11 cents a pound; Day & Frick, Philadelphia, 5.8 cents; John T. Stanley Co., New York, 7 cents; M. Schneider & Sons, Brooklyn, 5.5 cents and Pioneer Soap Co., San Francisco, 8.04 cents.

## Treas. Wax Bids

In a recent opening for miscellaneous supplies by the Bureau of Federal Supply, U. S. Treasury Department, Washington, D. C., the following bids were received on 33,000 gallons of water emulsion floor wax: W. H. Vale & Sons, Kansas City, $1.45. 1,100 gallons, 20 drums; J. A. Tumbler Laboratories, Baltimore, Md., 48.9 cents; Double-B Products Co., Hartford, Conn., 90 cents; International Metal Polish Co., Indianapolis, Ind., $1.03; Allen Burns Co., Buffalo, N. Y., 68 cents; T. F. Washburn Co., Chicago, 96 cents; Davies-Young Soap Co., Dayton, O., $1.05; Joseph E. Frankle Co., Philadelphia, 63 cents; Sears Roebuck & Co. Chicago, $1.08 in carload lots, $1.10, l.c.l.; Buckingham Wax Co., Long Island City, N. Y. 74.9 cents; Casein & Oil Products Co., Boston, 82 cents; Twin-City Shellac Co., Brooklyn, 70 cents; Chemical Manufacturing & Distributing Co., Easton, Pa., 65 cents; William Messer Corp., New York, 35 cents; Oil Specialties & Refining Co., Brooklyn, 75.3 cents; Bri-Test, Inc., New York, 48 cents; John C. Stalfort & Sons, Baltimore, 87.58 cents; Continental Car-Na-Var Corp., Brazil, Ind., $1.45; Stonhard Co., Philadelphia, $1.53; R. M. Hollingshead Corp., Camden, N. J., 59 cents; Fuller Brush Co., Hartford, Conn., $1.38, 55 gallon drums; Turco Products, Chicago, 83 cents; Peck's Products Co., St. Louis, $1.35; S. C. Johnson & Son, Racine, Wis., $1.38; Industrial Soap Co., St. Louis, $1.50; Knox Chemical Co., Chicago, $1.25; B. Preiser Co., Charlestown, W. Va., 78 cents; Lasting Products Co., Baltimore, $1.13; Ches-White Co., Baltimore, 60 cents; Science Industrial Manufacturing Division, St. Louis, 65 cents; Windsor Wax Co., Hoboken, N. J., 74.4 cents; G. & G. Paint Co., Washington, D. C., 95 cents; Wyandotte Chemicals Co., Wyandotte, Mich. $1.42 in carload lots; C. B. Dolge Co., Westport, Conn., $2.25; Trio Chemical Works, Brooklyn, 46 cents; Huntington Laboratories, Huntington, Ind., $1.35; Flexrock Co., Philadelphia, $1.03; D. A. Collins Mfg. Co., Brooklyn, 79 cents; Penetone Co., Tenafly, N. J., 61.1 cents; Hudson Supply & Equipment Co., Washington, D. C., $1.10; Wilbert Products Co., New York, 79 cents; Howell Brothers Chemical Laboratories, Philadelphia, $1.10; Ultra Chemical Works, Paterson, N. J., 84.9 cents.

## Snell on New Products

Dr. Foster Dee Snell, president of the New York consulting and engineering firm bearing his name, spoke on synthetic detergents, fluorescent dyes used in laundering, odorless germicides, glass wax type window cleaners and bar form synthetic detergents, before a recent meeting of the Springfield (Mass.) Industrial Association. His subject was: "What is New in Chemistry."

Dr. John R. Skeen, director of market research for the firm, was the guest speaker Nov. 3, before the New York Professional Chapter of Alpha Chi Sigma. He spoke on marketing in the chemical industry.

R. P. Van de Kasteele, president of N. V. Technisch Chemisch Adviesbureau, i.o., Eindhoven, Netherlands, is now in the United States, where he will remain until early December. He can be reached at Foster D. Snell, Inc., New York.

# HELIOCRETE

by

## A Schimmel Specialty

Offers the great beauty of the Heliotrope fragrance with none of the disadvantages of Heliotropin.

•

It is four times as strong and ten times closer to the natural Heliotrope fragrance with no chemical by-odor.

•

Stable against alkali, Heliocrete is excellent as a fixative.

schimmel

**601 west 26th street new york 1, n. y.**

# NEW TRADE MARKS

THE following trade-marks were published in the October issues of the *Official Gazatte* of the United States Patent office in compliance with Section 6 of the Act of February 20, 1905, as amended March 2, 1947. Notice of opposition must be filed within thirty days of publication. As provided by Secton 14, fee of ten dollars must accompany each notice of opposition.

**ALMAY**—This in upper case, open, italic letters beneath the drawing of a rose for shampoo. Filed Jan. 7, 1947 by Almay, Inc., New York, Claims use since Dec. 10, 1946.

**RAINBOW**—This in upper and lower case, extra bold script letters, ascending from left to right for hand cleaner. Filed Mar. 19, 1947 by Columbia Ribbon & Carbon Manufacturing Co., Glen Cove, N. Y. Claims use since Dec. 27, 1937.

**HURRICANE**—This in upper case, open and shadow letters for powdered cleansing composition for cleaning automobile bodies and other metal surfaces. Filed Apr. 24, 1947 by Lakeside Products, Chicago. Claims use since Apr. 18, 1942.

**CITRUS**—This in upper and lower case, extra bold, script letters above the drawing of a lemon for washing powder. Filed May 28, 1947 by Pacific Soap Co., Los Angeles. Claims use since 1893.

**SHERWIN-WILLIAMS**—This in large and small upper case, bold, italic letters for soap in dry, powdered, paste, semi-paste, liquid and and other consistencies. Filed June 24, 1947 by Sherwin-Williams Co., Cleveland. Claims use since 1905.

**PATEK INKEX**—This in upper case, extra bold letters ascending from left to right, one word above the other with a heavy rule between for liquid compound for removing ink from fabric. Filed July 19, 1946 by Patek and Co., San Francisco. Claims use since Feb. 1, 1937.

**AIRITE**—This in upper and lower case letters for insecticides. Filed June 16, 1947 by Airtite Mfg. Co., Toledo. Claims use since 1935.

**DENDROL**—This in upper case, extra bold, stencil letters for insecticides. Filed June 28, 1947 by Standard Oil Co., Whiting, Ind. Claims use since Dec. 13, 1926.

**SHEER**—This in upper and lower case, extra bold script letters above the words "loads of suds" on a bubble background for household cleaning preparation. Filed Jan. 8, 1946 by Detergent Products, Inc., Philadelphia. Claims use since Nov. 8, 1945.

**"FOX GLAZED"**—This in upper and lower case, script letters beneath the drawing of the head of a fox for fluid for cleaning and treating furs. Filed July 31, 1946 by I. J. Fox, Inc., New York. Claims use since Aug. 7, 1945.

**SPORTSMAN**—This in upper and lower case, medium bold, script letters for insect repellent. Filed Nov. 5, 1946 by John Hudson Moore, Inc., New York. Claims use since Octo. 20, 1944.

**LUS TR LOX**—This in upper and lower case, medium bold, script letters for shampoo. Filed Dec. 6, 1946 by Lus Tr Lox Products, Inc., Salt Lake City, U. Claims use since Jan., 1936.

**B AND R**—This in extra bold, upper case letters for "B" and "R" and lower case script letters for "and" all within an oval-like heavy rule for spot remover. Filed Apr. 25, 1947 by Brannan and Ross Chemical Products Co., Dallas, Tex. Claims use since Apr. 10, 1946.

The following trade marks are published in compliance with section 13 (a) of the Trade Mark Act of 1946. Notice of opposition must be filed within 30 days of publication and a fee of $25 must accompany each notice of opposition.

**PEACOCK ROYAL SILVER POLISH**—This in upper case letters as part of a coat of arms for silver polish. Filed July 16, 1947 by C. D. Peacock, Inc., Chicago. Claims use since 1942.

**SAVON CASTILE**—This in upper and lower case, medium script letters for the word "Savon," above the word "Castile," which is in upper case reverse letters on a solid reverse rectangular background and cutting into the letter "s" of the word "Savon" is the fanciful portrait of the head and shoulders of a child in a circle for soap. Filed Aug. 7, 1947 by Los Angeles Soap Co., Los Angeles. Claims use since 1908.

**GOLD TAG**—This in upper case, medium bold letters for soap. Filed Aug. 15, 1947 by Gold Par Products Co., New York. Claims use since Feb., 1936.

**LUMABRITE**—This in upper case, extra bold letters for preparation for cleaning and polishing aluminum. Filed Aug. 19, 1947 by Selig Co., Atlanta. Claims use since June 16, 1947.

Fanciful drawing of a wave like design across the face of a circle for scale and milkstone deposit remover in powdered form for use in cleaning milk cans. Filed Sept. 18, 1947 by Diversey Corp., Chicago. Claims use since Jan. 11, 1939.

**AVON**—This in upper case, extra bold, oversize letters for shaving cream. Filed Oct. 7, 1947 by Avon Products, Inc., New York. Claims use since Sept., 1929.

**PRELUDE**—This in upper case, medium bold letters for toilet soaps. Filed Oct. 30, 1947 by Jacquet, Inc., New York. Claims use since Sept. 24, 1947.

**TAG**—This in upper case, oversize open letters for soap. Filed Nov. 12, 1947 by M. Werk Co., St. Bernard. Claims use since Jan. 1, 1907.

**DYCOTE**—This in upper case, medium bold letters for liquid preparation for polishing leather shoes. Filed Jan. 21, 1948 by Griffin Manufacturing Co., Brooklyn, N. Y. Claims use since May 28, 1937.

**ANATROX**—This in upper case, extra bold, stencil letters for liquid, organic chemical detergent. Filed May 14, 1948 by General Aniline & Film Corp., New York. Claims use since Mar. 26, 1948.

**STAYNER**—This in upper and lower case, medium script, reverse letters on a solid reverse circular background for insecticides. Filed Aug. 26, 1947 by Stayner Corp., Berkeley Calif. Claims use since Jan. 25, 1940.

**MADABEAU**—This in upper case, extra bold, oriental type letters in the form of an arc for shampoo. Filed Oct. 29, 1947 by W. S. Forman Co., Chicago. Claims use since Jan., 1946.

**PET-A-POO**—This in upper case, extra bold letters for dog shampoo. Filed Nov. 1, 1947 by Vowel Co., St. Louis. Claims use since June 16, 1947.

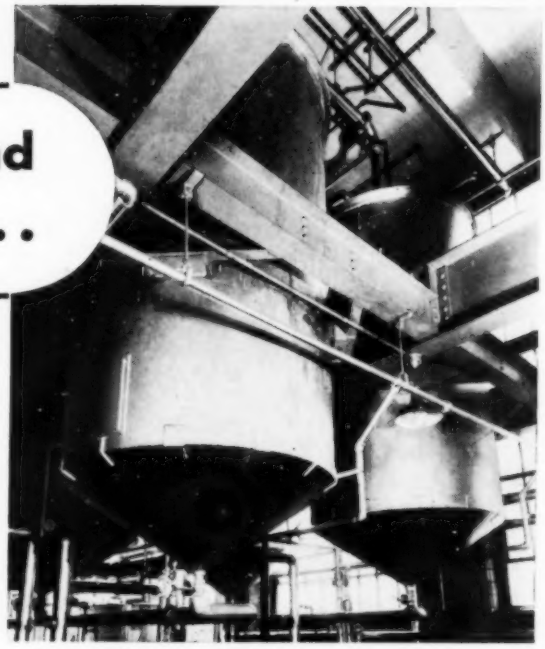
**SEP-KO WETTING COMPOUND**—This in upper and lower case, extra bold script letters for the word "Sep Ko," which is above the words "Wetting Compound," which are in upper case, bold, smaller letters with an rectangular box for wetting agent to be added to water to remove scum, milk stone etc., from dairy processing equipment. Filed Nov. 20, 1947 by Monarch Soap & Chemical Co., Minneapolis. Claims use since Aug. 1, 1947.

**FESS UP**—This in upper and lower case, medium bold, script letters for shampoo. Filed Jan. 19, 1948 by M. Lange Beauty Products, Rochester, N. Y. Claims use since Jan. 8, 1948.

**MOTH-PANIC**—This in upper case, bold letters on a pennant like background for mothproofing liquid. Filed Feb. 9, 1948 by Feller-Jones

# For new equipment and for repairing the old . . .

## NICKEL-CLAD
## STAINLESS-CLAD
## INCONEL-CLAD
## MONEL-CLAD
## STEELS



Two glycerine bleach tanks built of Lukens 10% Nickel-Clad Steel.

You've probably noticed the trend—new equipment given the corrosion-resisting ability of *solid* nickel, stainless steel, Inconel or Monel through the use of steel that is *clad* by Lukens with one of these metals. New equipment is, therefore, more economical to buy and operate.

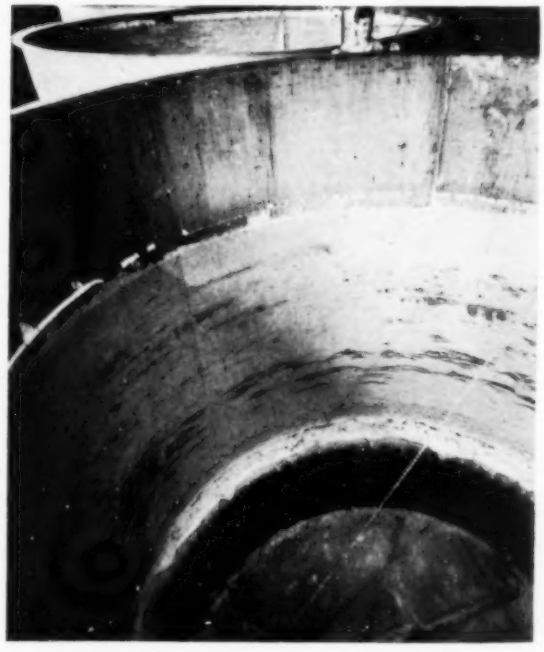
Processors are similarly profiting as old equipment needs repairs. They use Lukens Clad Steels to replace old parts, obtaining protection of products against metallic and rust contamination, along with lower upkeep and longer equipment life.

There's a whole family of Lukens Clad Steels—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad—enabling you to choose the metal best able to provide the protection you require. The extra smooth sodium hydride finish makes equipment extra easy to clean. Claddings 10% or 20% of total plate thickness suit most applications.

Bulletins 255 and 338 contain data on Lukens Clad Steels. For copies, write Lukens Steel Company, 446 Lukens Building, Coatesville, Penna.

CLAD METAL STEEL

Below: This nickel-clad soap kettle proved so successful that the top ten feet of a 50-year old steel kettle in the same plant were replaced with Lukens Nickel-Clad Steel.



**LUKENS**

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
**STEELS**

**SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY**

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

Corp., New York. Claims use since Jan. 27 1948.

**VOO DOO WHITE MAGIC**—This in large and small, extra bold, upper case letters for the words "Voo Doo" and bold face, upper and lower case script letters beneath for the words "White Magic," between all of which is the fanciful drawing of a canabalistic face for insecticide. Filed Mar. 18, 1948 by Xterminator Products Corp., Jersey City, N. J. Claims use since Sept. 10, 1947.

**NICONA**—This in upper and lower case, extra bold, script letters for insecticides. Filed Apr. 10, 1948 by Shell Oil Co., San Francisco. Claims use since Mar. 19, 1928.

**GREETING** — This in upper case, fancy, italic letters for bar soap in packaged form. Filed Jan. 22, 1948 by Corona Soapcrafters, Redlands, Calif. Claims use since Jan. 8, 1947.

**SALUTATION**—This in upper case, fancy, italic letters for bar soap in packaged form. Filed Jan. 22, 1948 by Corona Soapcrafters, Redlands, Calif. Claims use since Jan. 8, 1947.

**BIG BOSS**—This in upper case, extra bold, stencil letters for laundry bar soap. Filed June 3, 1948 by Cudahy Packing Co., Chicago. Claims use since Feb. 15, 1927.

**ANT-GO**—This in large and small, extra bold, oversize letters for insecticide for ants. Filed Dec. 16, 1947 by W. R. Sweeney, Mfgr., Salisbury, Mo. Claims use since Apr. 1, 1934.

**HY-LO**—This in large and small, extra bold, inline, oversize letters for powder and liquid spray insecticide. Filed Dec. 16, 1947 by W. R. Sweeney, Mfgr., Salisbury Mo. Claims use since Feb. 1, 1923.

**SWEENEY'S**—This in large and small, extra bold, capital letters, ascending from left to right for insecticide. Filed Dec. 16, 1947 by W. R. Sweeney Mfgr., Salisbury, Mo. Claims use since Jan. 1, 1892.

**NU-BORDO**—This in upper case, extra bold, italic letters for insecticides. Filed Dec. 23, 1947 by Sherwin - Williams Co., Cleveland. Claims use since Aug. 2, 1933.

**MEL-O-AIR**—This in upper case, extra bold letters for industrial deodorants. Filed Jan. 9, 1948 by Modern Deodorant Co., Jamaica, N.Y.

**AUTO-CHLOR**—This in upper and lower case, bold, script letters for chemical solutions for sterilizing eating utensils. Filed Feb. 24, 1948 by Auto-Chlor System, Inc., Memphis. Claims use since Jan. 1, 1938.

**GDC**—This in upper case, bold letters within a diamond which is located at the vortex of a whirling design for detergents for washing,, scouring and cleansing all kinds of textile materials. Filed July 14, 1947 General Dyestuff Corp., New York. Claims use since Nov. 8, 1946.

**SHEER**—This in upper and lower case, medium letters for sudsing cleaner, cleanser and detergent. Filed July 5, 1947 by Procter & Gamble Co., Cincinnati. Claims use since Aug. 22, 1938.

**FILMOLEEN**—This in upper case, extra bold letters for cleaning fluid for cleaning photographic film. Filed July 26, 1947 by Bell & Howell Co., Chicago. Claims use since July 10, 1930.

**DIMITY**—This in lower case, case, medium letters for sudsing cleaner, cleanser and detergent. Filed Sept. 12, 1947 by Procter & Gamble Co., Cincinnati. Claims use since Feb., 1936.

**GOLDEN KEY**—This in upper and lower case, extra bold, inline, script letters, one word above the other and ascending from left to right for shaving cream. Filed Mar 1, 1948 by Great American Tea Co., New York. Claims use since Mar. 5, 1932.

**GOLDEN KEY**—This in upper and lower case, extra bold, italic letters, ascending from left to right, one word above the other and superimposed upon a circle, for cleansing preparation in powder form for general household and laundry use. Filed Mar. 1, 1948 by Great American Tea Co., New York. Claims use since Dec. 11, 1942.

**BUCKSHOT**—This in upper case, extra bold letters for laundry soap in powdered form. Filed June 3, 1948 by Cudahy Packing Co., Chicago. Claims use since Feb. 18, 1919.

**FURST-MCNESS COMPANY**—This in upper case letters in the form of an arc and superimposed upon a circular design above the drawing of a mortar and pestle, beneath which are the words "always good" and "Freeport, Illinois, U.S.A." for tooth paste. Filed Sept. 19, 1947 by Furst-McNess Co., Freeport, Ill. Claims use since 1927.

**NO EQUAL**—This in upper case, extra bold letters for dentifrices. Filed July 16, 1947 by No Equal Products Co. Not Incorporated and Nature's Mineral Health Food Shop, Chicago. Claims use since Dec. 2, 1927.

**SELECTONE**—This in upper case, extra bold, letters for insecticides. Filed Sept. 22, 1947 by California-Spray Chemical Corp., Richmond, Calif. Claims use since Aug. 1, 1947.

**ENOZ**—This in upper and lower case, extra bold, inline letters for insecticides. Filed Oct. 28, 1947 by Diversey Corp., Chicago. Claims use since Feb., 1921.

**BOCONIZE** — This in upper case, extra bold letters for chemical compounds used to make fabrics moth resistant. Filed Nov. 13, 1947 by Bocon Chemical Corp., New York. Claims use since May 5, 1947.

**RUSTEZE**—This in upper case, extra bold letters for chemical preparation for removing stains from textile materials. Filed Nov. 26, 1947 by Hood Chemical Co., Pittsburgh. Claims use since June, 1932.

**ROOTKARE**—This in upper case, extra bold letters for shampoo. Filed Dec. 3, 1947 by Ame Cosmetic Co., New Haven, Conn. Claims use since Feb. 25, 1941.

**MILORD**—This in upper case, medium bold letters for shampoo. Filed Jan. 30, 1948 by D'Orsay Perfumeries Corp., New York. Claims use since 1932.

**PARADIZE**—This in large and small upper case letters for moth repelent. Filed Feb. 14, 1948 by Paradize Products Corp., Fultonview, N. J. Claims use since Dec. 8, 1947.

**SHAM-TABS**—This in upper and lower case, extra bold letters for creme shampoo in tablet form. Filed Mar. 8, 1948 by Eugene Jeral, Chicago. Claims use since Mar. 5, 1948.

**LUSTER-BRYTE**—This in upper and lower case, extra bold, script letters for wax finish for floors of various compositions. Filed Aug. 16, 1947 by U. S. Sanitary Specialties Corp., Chicago. Claims use since Sept. 2, 1931.

**GIANT**—This in upper case, extra bold, oversize letters for soap. Filed July 29, 1947 by Armour and Co., Chicago. Claims use since Oct., 1922.

**INDUSTRIAL**—This in upper case, medium bold letters for soap. Filed July 29, 1947 by Armour and Co., Chicago. Claims use since June 19, 1930.

**HOSPITAL GREEN**—This in upper case, medium bold letters for soap. Filed July 29, 1947 by Armour and Co., Chicago. Claims use since 1920.

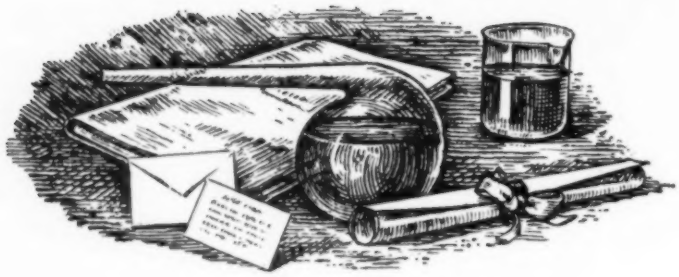
**INLAND**—This in upper case, extra bold, italic letters for cleaners and solvents for cleaning surface of rubber articles. Filed Aug. 16, 1947 by Inland Rubber Corp., Chicago. Claims use since May 1943.

**FLOOR SHINE**—This in upper case, bold letters for cleanser for various types of floor surface. Filed Aug. 22, 1947 by Walter Legge Co., New York. Claims use since Mar. 1, 1932.

**HAMPDEN**—This in upper and lower case, medium bold, script letters, ascending from left to right for detergents for industrial use. Filed Sept. 5, 1947 by Hampden Color and Chemical Co., Springfield, Mass. Claims use since 1925.

**CONNOISSEURS**—This in upper and lower case, bold, Old English letters above the fanciful drawing of a bowl for cleaner for jewelry, watches and eyeglasses. Filed Oct. 21, 1947 by Connoiseurs Products Corp., Boston. Claims use since Sept. 4, 1946.

(*Turn to Page* 143)



*To manufacturers of detergents for home and industry and others whom it may concern:*

*This certifies that Wyandotte Carbose*, having passed extensive laboratory and field tests, has proved its great value in boosting and extending the washing power of detergents designed for a wide variety of applications.*

*Carbose promotes to a high degree the qualities of carbon soil removal and whiteness retention in these detergent formulations.*

*Reg. U. S. Pat. Off.

## Why not try Carbose in your formulations?

Carbose is now available in commercial quantities. For samples and additional data, write the Development Department, Wyandotte Chemicals Corporation, Wyandotte, Michigan.

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Soda Ash • Caustic Soda • Bicarbonate of Soda • Calcium Carbonate • Calcium Chloride • Chlorine • Hydrogen • Dry Ice • Synthetic Detergents
Glycols • Ethylene Dichloride • Propylene Dichloride • Chloroethers • Aromatic Sulfonic Acid Derivatives • Other Organic and Inorganic Chemicals

# RAW MATERIAL MARKETS

**As of Nov. 1, 1948**

THE coconut oil situation, as a result of the continued strike of shipping on the west coast, continues to dominate the news of the vegetable oil market. Some oil is coming to New York and other east coast ports direct from the Phillippines, but none is reported entering Pacific Coast ports. A little copra is said to be arriving on the West Coast however, although it is merely a trickle. Philippine coconut oil coming into New York is reported to be selling in bulk at about 23½-24 cents a pound, six to eight weeks' delivery. Spot oil, where available is selling in the 26-26½ cent range. A small amount of coconut oil from Ceylon has come in and is said to be priced at 26 cents a pound range in drums.

Another important soap fat, tallow, recently advanced one cent per pound, the fancy grade price now being 14 cents, as against 13 cents at about this date a month ago.

Most other oil prices rose somewhat during the month. Cottonseed oil is two and one-half cents a pound higher than it was a month ago; soybean oil is up a cent; corn oil at 23 cents a pound is currently two cents above its price as of this date a month earlier. Peanut oil is down a cent. Copra, as might be expected, is up eight dollars a ton, Pacific Coast basis.

The effect of the west coast shipping tie-up on the coconut oil market can be gathered from the fact that during September, shipments of copra from the Philippines to the United States totaled 20,947 long tons, which is considerably below the monthly average for 1948. A further decline in imports was expected during October as a result of the strike. Shipments to Europe, on the other hand, will be larger. Total exports of copra from the Philippines totaled 44,747 tons and 2,691 tons of coconut oil, of which the U. S. received 2,480 tons.

Lower prices of fats and oils during the next 12 months were predicted recently by the Bureau of Agricultural Economics, Washington, D. C., as a result of increased domestic production of fat bearing materials. The increase may run from three to four percent more than the 9.9 billion pounds produced in the 1947-48 crop year, the Bureau pointed out. Coco-

nut oil and edible vegetable oils would show the greatest price decline, it was reported.

One important soap making fat that may not go lower in price is tallow, the output of which is expected to decline somewhat in the next year. Lard and grease will maintain last year's production level, the report of B.A.E. states. A continued strong demand from Europe for U. S. fats and oils is expected to continue throughout 1949, but if controls over exports should lapse with the expiration of present legislation on Feb. 28, 1949, exports of fats and oilseeds that are relatively low in price, notably lard and soybeans, probably would increase materially. Export allocations of fats and oils are running about the same as in 1947, when a billion pounds of fats and oils and oil bearing seeds were exported. Consumption of fats and oils during 1949 in the United States is expected to show an increase over last year, because of the expanded industrial activity.

Meanwhile, a charge that the Government through its foreign export allocation program on fats and oils was deliberately keeping down prices on inedible tallow and grease was made by small packers and renderers in a letter sent to Commerce Secretary Charles Sawyer. The group contends that for inedible tallow and grease products to be in harmony with prices for all farm products and live stock, domestic prices of inedible tallow and grease would have to be around 15 to 21 cents a pound, as against prices of 8 to 14 cents that now exist.

A large surplus of carnauba wax in Brazil is anticipated if minimum price controls on the material are not eliminated, it was learned recently. A surplus of nearly 12,000,000 pounds is now predicted. Exports of carnauba to the U. S. which normally takes about 80 percent of the Brazilian product, were 6,408,695 pounds, as compared with 17,708,538 pounds in the first six months of 1946. Another factor that may affect carnauba stocks is widening replacement of certain types of the wax with other materials. This trend is expected to continue and broaden so as to considerably reduce the size of the U. S. market for carnauba in the future. A 10 cent price cut is said to be sufficient to re-interest American manufacturers in carnauba, which is selling from 79 cents to $1.09 for fatty grey and type I grades, respectively.

Paradichlorobenzene, the price of which is now down to about what it was six years ago, is in the unusual position of selling for less than naphthalene. Increased production seems to be the answer to the present condition. The number of producers has considerably increased in recent years, while many users have turned away to other materials because of the shortage of para. However, with two new large producers reported getting ready to enter the field after the first of the year, more production and a favorable price should induce greater consumption.

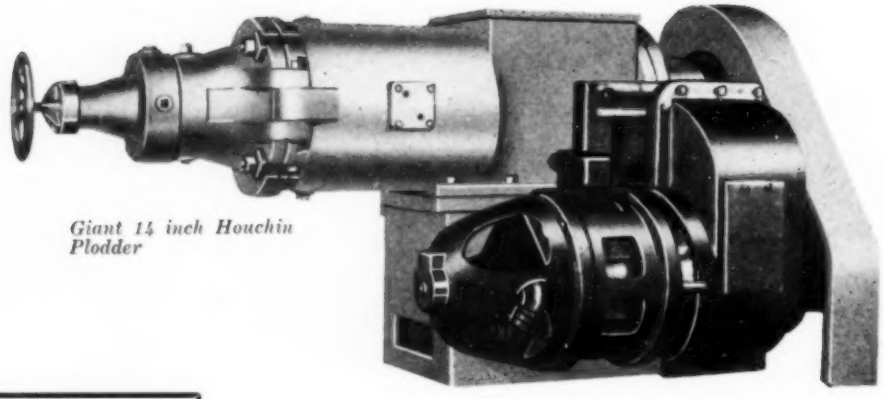
Further declines in the price of perfuming materials occurred late last month, when such leaders as eucalyptus, geranium and cedarleaf oils declined from one to 10 cents a pound.

# *Tailor-Made for the Job*

**HOUCHIN** are specialists in the manufacture of Soap Making Machines—with a background of over 75 years of experience and service to the industry.

Houchin soap machines are designed and fabricated to give the utmost in quality of production, ease of operation and efficiency—to meet the most exacting of production requirements.

# HOUCHIN PLODDERS



*Giant 14 inch Houchin Plodder*

**Included in the Complete HOUCHIN LINE are:**

- CHIPPERS
- AMALGAMATORS
- MILLS
- PLODDERS
- CUTTING TABLES
- CRUTCHERS
- CAN TOP SEALERS

etc. . . .

**FOR HEAVY PRODUCTION:** This giant Houchin Plodder has a capacity of from 4,000 to 6,000 pounds per hour. Screw diameter is 14 inches. Other Houchin Plodders have screw diameters of from 2½ to 14 inches.

A small combination plodder especially designed for laboratory use—for making tiny cakes of perfumed soaps, is also available. It requires only a ⅓ h. p. motor with Texrope drive.

•

Repair parts are available.

*For further information write to*

# HOUCHIN
## MACHINERY COMPANY, INC.

*Manufacturers of Soap Making Equipment*

FIFTH AND VAN WINKLE AVENUES — HAWTHORNE, N. J.

PRODUCTION SECTION

# Oil Refining by Distillation

STEAM distillation removes free fatty acids from oils and fats to give fatty acids of superior quality with very little loss of neutral oil, in contrast to the older lye-refining method.

Oils and fats all contain mixtures of fatty acids, each acid having its own boiling point. The boiling points of some common fatty acids are:

| | *Stearic* | *Oleic* | *Palmitic* |
|---|---|---|---|
| At 40 mm.. pressure | 267°C. | 260°C. | 252°C. |
| At 20 mm. pressure | 247° | 239° | 231° |

The boiling point of a mixture as it occurs in oils is always higher than that of the substance present having the highest boiling point. Some mixtures show an increase of 60°C., but this can be lowered by use of steam and reduced pressure.

### Steam and Low Pressure

IN a typical British process, the crude oil is first refined with activated earth to eliminate impurities which would tend to darken both the distilled fatty acids and the deacidified oil. The oil is then treated with steam under reduced pressure, which volatilizes the fatty acids and certain impurities. The temperature in the distillation vessel may be 240-60°C., depending on the nature of the oil.

### Superheated Steam

IN the Lurgi process a high vacuum is produced and the distillation temperature is reduced by about 60° C., in comparison with low-pressure distillation. The high vacuum preserves the quality of the products and prevents their decomposition. Clean separation of fatty acids and oil is effected so that after-treatment with caustic lye to remove residual acidity may be unnecessary. Steam is used as the heating medium.

A modern technique, based on the Wecker process, successfully operated in Germany before 1939, is applied in Britain and is called the Bamag-Wecker process. Wet steam comes into sudden contact with crude oil at a temperature higher than the original temperature of the steam. The very fine particles of wet steam expand with almost explosive violence and, in doing so, carry away from the oil itself the free fatty acids present in the vessel in the vapor phase.

In operation, the crude oil undergoes pre-cleaning by passing through several screens which retain most of the suspended impurities. From the storage tank the oil next goes through preheaters into the reaction vessel. The latter, constructed of special acid-resisting material and rectangular in shape, has a number of interconnecting chambers. It is heated to 200-280°C., depending upon the oil being treated.

The oil or fat flows in a thin film along the bottom of the apparatus, and a rapid volatilization of acids is induced. Due to the high vacuum, the particles of relatively cool steam injected expand instantaneously. As a consequence the vaporized fatty acids and all the volatile odor carriers are caused to leave the vessel at 120-50°C. The vapor goes to the cooler where condensation of fatty acids and other volatile constituents is effected.

The Bamag-Wecker process in practice has given results which almost reach the theoretical. Formerly it was impossible to expose easily polymerized oils such as linseed oil to high temperatures. By this technique, however, fatty acids of linseed oil as well as other highly unsaturated oils, can be distilled without decomposition or polymerization; the iodine value remains unchanged. Even when treating waste fats of poor quality, no unsaponifiable compounds are formed, so that oil losses are infinitesimal.

### Soap Production

USE of the pure fatty acids so obtained permits employment by the soap maker of carbonate saponification. This is cheaper than lye saponification. The time and quantity of steam required is less for production of soap. The fatty acids usually contain only a very small proportion of neutral oil and very little contaminating volatile matter. The latter can often be separated by condensing at different temperatures.

### Heller Process

IN the Heller process, free fatty acids which are volatilized only with difficulty, are esterified with coconut oil. By this means, peanut oil can be successfully treated. The basis of the method lies in the fact that the effect of the steam on the hot oil is not only to distil the fatty acids, but also to split the glycerides partially, with reesterification.

If coconut oil is added to another oil containing free fatty acids and the mixture is treated as described, the fatty acids in an oil such as peanut oil will take up glycerine to form new

glycerides. A corresponding amount of coconut oil fatty acids—which are more easily volatilized—are set free, and distil over.

For example, 150 grams of peanut oil having a free fatty acid content of 3.35 per cent, have been treated for 40 minutes, using 120 grams of steam at 287-315°C. at normal pressure. The treated oil still contained two per cent of free fatty acids. The experiment was repeated, this time with addition of five grams of coconut oil. The free fatty acid content was reduced to 0.4 per cent.

The plant used for this process consists of a reaction vessel of aluminum alloy through which oil is continuously drawn by means of a vacuum pump. Within the vessel the oil is atomized and brought into contact with a counter current of superheated steam. It is exposed to a high temperature for only a relatively short time.

In the early days of deacidifying oils by distillation, the fatty acids obtained were often dark in color and contaminated with impurities, but these difficulties have gradually been overcome by carefully cleansing the oil before distilling. As now used, distillation methods make possible the economic refining of oils which could not be handled this way economically before. Fatty acids of good grade constitute an important yield from the process. A. E. Williams, *Chem. Age* 59, 245-8 (1948).

## Abietic Acid from Rosin

Sulfonated abietic acid is produced by reacting rosin with fuming sulfuric acid in the presence of an aluminum borate catalyst in ether at —10°C. The product has good dispersing power. D. Fronmuller and B. B. Thomas, to the Inst. of Paper Chem. Canadian Patent No. 450,303.

## Partial Hydrogenation

Alkali-refined linseed oil was partially hydrogenated, using both continuous and batch processes. Batch hydrogenation yielded oils of superior non-yellowing characteristics over comparable oils prepared by the continuous process. F. G. Smigh, *J. Am. Oil Chemists' Soc.* 25, 3p8-34 (1948).

## Soap in Fruit Washing

Investigators at the Florida Agricultural Experiment Station, Gainsville, Fla., have recently concluded that when soap is used to wash oranges in the packing house it has no significant effect in eliminating stem-end rot or mold on fruit during the marketing period. Detergents do not help much either, it was decided. Seventeen tests from six different commercial packing houses were made during one season. In each test 100 unwashed oranges from the belt were examined after storage, along with another hundred which had been washed with soap in a washer, followed by a rinse. A total of 3,400 fruits were examined and, according to the report, the soap used in these packaging houses at the time was "Palmolive" soap chips.

Significantly larger percentages of washed oranges showed stem-end rot after one and two weeks in storage than did the unwashed oranges and at the end of three weeks' storage, both lots showed 21.6 percent infected. Washed fruits showed higher percentages for mold than did the unwashed checks after one and two weeks' storage, while at three weeks the figures were 4.5 percent for the check and 4.9 percent for the washed fruit. Averaging, it was found that after three weeks' storage, total decay in the unwashed fruit was 26.1 percent and in the washed fruit it was 26.4 percent.

"This shows clearly," continues the report, "that washing with soap had no influence on the development of either stem-end rot or molds. The small differences are not significant, since the probable error is two percent to three percent . . . . In this investigation it was also shown that neither of the two (types) of stem-end rots showed any significant increase due to washing."

The report observes that, in general, commercial packing houses are quite economical in their use of soap. So additional tests were run with more soap suds than used in commercial practice. And here 42 percent of the fruit washed only in tap water showed decay, while fruit washed in a one percent soap solution showed a 40 percent decay.

"Here again," says the report, "there is shown no significant effect of soap on rot or mold in oranges."

In another series of tests eight proprietary detergent compounds (not named) were compared with plain tap water and "Palmolive" soap chips. "At both two and three weeks' storage," says the report, "the results showed no significant difference. The check washed in plain water showed 35 percent stem-end rot and 32 percent mold, while the lot washed with the detergents had 23 percent stem-end rot and 33 percent mold."

## Testing Wetting Power

Of the numerous methods which have been used to determine wetting power, the most important are: Immersion, forced immersion, centrifuge, and elongation of thread. In the first, the time required for samples of fabrics to fall to the bottom of a test bath under standard conditions, is determined. In the second, the time is determined for the piece of fabric carrying a definite weight, to sink to the bottom of a test solution. In the third, the quantity of liquid absorbed by the fabric in a given time is measured after the liquid is removed by centrifuging; the fabric is weighed before and after. In the fourth, the increase in length of a heavily twisted thread is measured after wetting by the test solution. Several modifications of these methods have been made. J. P. Sisley and P. J. Wood, *Am. Dyestuff Reporter*, 37, 635-42 (1948).

## Rearranging Radicals

The fatty-acid radicals of mixed saturated-unsaturated triglycerides rearrange to form solid and liquid triglycerides when a mixed fat is treated below 160°F. with a sodium alkoxide catalyst. The solid triglycerides formed are those least soluble in the liquid phase at the temperature of the reaction. By this method 47 per cent of stearin was obtained from cocoa butter. E. W. Eckey, to Procter & Gamble Co. Inc. U. S. Patent No. 2,442,531.

# IMPORTANT!

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***the original dishwashing and sanitizing service***

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We are offering attractive profit-making opportunities for qualified dealers to represent the AUTO-CHLOR SYSTEM. This service business is especially adaptable to persons selling the restaurant and bar trade. Accounts are easily sold, and continued servicing at regular intervals assures substantial profits. The AUTO-CHLOR SYSTEM is a fool-proof, fully automatic method for accurately mixing detergent and sanitizing solutions for hand dish washing. The AUTO-CHLOR SYSTEM is the answer to efficient, dependable sanitization. It is the most practical, inexpensive, and effective means known for washing and sanitizing eating utensils. Every restaurant, soda fountain, and bar in your city will want this service.

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Some territories are still open. We are offering exclusive representation to reliable dealers on a franchise basis. Territories are strictly protected. Every AUTO-CHLOR SYSTEM representative enjoys complete rights to the full profit-making opportunities that his territory has to offer.

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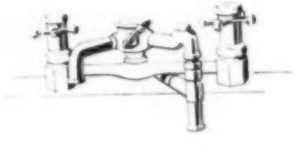
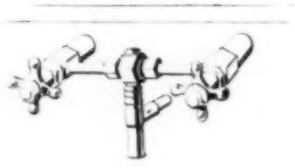




## PRODUCTION CLINIC

By E. G. THOMSSEN, Ph.D.

IN discussing the operation of a flake soap drying system, we have considered the importance of the following: having a uniform soap delivered to the rolls, keeping a uniform film on the rolls, running at proper film thickness, and maintaining the proper temperature in the drying compartment. Other factors in flake soap drying upon which we will comment are the control of proper drying temperature of the soap, the importance of the setting of the knife and the speed and uniformity of the rolls. For reliable information on these points, we are again indebted to the engineering department of Proctor and Schwartz Co., Philadelphia, from whose data we are quoting fully on the points listed above.

Proctor and Schwartz continuously carry on actual field tests to improve the operation of their dryers. From these experiments with flake soap they have concluded that the temperature of the soap at the time it enters the hopper is important. The temperature must be maintained very uniformly to produce the highest volume of flakes. If uneven chilling takes place when the liquid soap enters the hopper and the soap's temperature varies, the output is greatly reduced.

The temperature on the surface of the rolls must be taken into consideration. The roll surface temperature can be maintained evenly, only if the water enters the inside of the cylinder as a film-like spray and then is drawn off rapidly. The cooling water for use in the chilling roll greatly influences the output of the drying system. Unless the temperature of the cooling water is properly maintained by the inlet valve to keep the outflow at constant temperature, the volume of dry flakes will be reduced.

As to the knife on the chilling roll, these comments from the makers of the Proctor dryer are pertinent: "In producing flake soap, the location of the knife in relation to the roll is a very important factor in maintaining the proper thickness of the chip.

DR. THOMSSEN

Any slight deviation of the inclination of the knife, in relation to the roll, materially influences the thickness of the flake and the output of the dryer. Our experience demonstrates that for ordinary toilet and laundry soap, a flexible knife produces the best results, especially so if the knife oscillates to maintain a uniform sharpness. However, when soap contains a high percentage of silicate of soda, a lower temperature of the cooling water is required to crystallize the soap and bulder and a thicker, more rigid knife is preferred. Actual runs of such soaps also indicate that for best results the edge of the knife should not be very sharp and that a bevelled edge is most satisfactory."

The final consideration in operating a flake soap dryer is the question of speed and uniformity of the rolls. Proctor & Schwartz have conducted many experiments to determine the best position of the small feed roll with respect to the large chilling roll. Their conclusions are these:

"We found that the most uniform density of the soap flake is maintained when the feed roll travels against the direction of the inflow of liquid-hot soap. This compresses the soap on the large roll and makes the soap of a dense, uniform character. Experiments also have indicated that the speed of the feed roll is not of great import provided it rotates at a slow enough speed.

"Experience has demonstrated further that a thin chip can be obtained by high speed of the chilling roll. The thickness of the soap flakes is increased as the speed of the chilling roll is decreased.

"Actual test runs have shown also that it is necessary to have uniformity of diameter of the rolls in order to obtain maximum output. Any slight variation in the diameter, especially of the feed roll, materially reduces the production obtained from the dryer. It is of utmost importance, then, to obtain a machine with accurate diameter rolls and to maintain them properly."

Not so long ago we ran into another problem occasioned by the production of soap flakes. The problem had to do with the drying of low titred soap, in one case, to about 15 percent moisture; in the other down to three percent moisture. Low titred soaps do not withstand as much heat as ordinary soaps. Once they are overheated they melt down to small masses on the drying aprons, clog the screens, and cause a mess which it takes hours to clean up.

In one case, the soaper tried to dry his soap with air that had been de-humidified by lowering the temperature. In the other case, it was attempted to dry the flakes by keeping down the temperature by admitting the heating steam very slowly. Neither method gave good results.

One soaper dried his low titred soap quite successfully. He used old type, small rolls on his dryer and had these rolls moved back about six feet, extending the conveyor apron. The rolls were moved back because the knife taking the chips off the chilling rolls was located too close to the floor, thus necessitating too steep a lift by the conveyor apron to the drying compartment of the drying system. The steep incline caused the soap ribbons to break up instead of lying

as long, ribbon-like strips on the dryer aprons in the drying compartment. In the form of long ribbons, the soap dries much more easily. By moving the rolls back, the conveyor apron moves up a much more gentle incline and deposits the ribbons on the dryer compartment aprons in such condition that they dry more easily than as small compact curls.

Precautions also were taken at the drying compartment to obtain satisfactory results. The travel speed of the wire apron inside of the dryer was slowed down so that the soap remained for about 35 minutes in the 30-foot long compartment. The exhaust ducts were enlarged so that their ratio was about four intake of air to five of outlet. Another blower was installed and the heat was kept very low, the temperature depending upon the melting point of the soap being dried.

With this arrangement, it was possible to produce soap flakes of 2½ percent moisture at the rate of approximately 750 pounds per hour. No difficulty was encountered if the soap were fed at the proper rate by the chilling rolls.

The operation of a dryer is an important part of soap processing. We are sure that the manufacturers of the drying system do not have all the answers but as they see many machines in operation their suggestions are of much importance.

### Portable Steam Cleaning Machine

Livingstone Engineering Co. of Worcester, Mass. is offering a new electric steam cleaning unit for industrial plants. The machine weighs about 400 lbs., is mounted on casters, is driven by a 220 V., A.C. motor and includes the nesessary cleaning accessories. The product is known as the "Speedylectric Steam Jet Cleaner." Steam is fed to the cleaning nozzle at which point soap or other detergent may be applied from a control valve. As the steam meets the surface to be cleansed, such as walls, floors, windows, machinery or tools, the detergent is atomized with the steam. The liquid detergent flow is regulated at a specified pressure maintained on the tank containing the detergent. Time and labor are saved by the use of this machine according to the company.

### Carnauba Wax Extender

Monsanto Chemical Co., St. Louis, is offering "Arochlors," a series of chlorinated biphenyl and chlorinated polyphenyls, as replacements for carnauba wax in polishes for automobiles, wood, leather, etc. It is claimed that the use of these synthetics, in part or entirely as replacements for the natural wax, results in economies in cost, with improvement of quality. The "Arochlors" are said to be similar to carnauba wax, and when properly blended to give performances of hardness, texture and melting point equal to carnauba. If combined with ouricury wax in the proper proportions, it is impossible to eliminate carnauba wax entirely in certain formulations.

### Vibratory Spiral Elevator

Among the many uses to which "Syntrons," made by Syntron Co., Homer, Pa., are put, a new way to elevate bulk material by vibration is of interest. The equipment may act both as an elevator and feeder if necessary. It may be had in various diameters, capacities and lengths. No moving parts, motors, chains, belts or brackets are necessary for its operation. The "Syntron" elevator consists of a vertical spiral ramp that goes up or down along which the material flows at high speed and with no effort. High speed electromagnetic vibrations actuate the elevator and a rheostat controls the rate of flow. Fragile materials are readily handled.

### New Ion Exchangers Explained

A complete and graphic round-up of ion exchange technology and information has recently been published by Resinous Products & Chemical Co., Philadelphia. Publication of these data was prompted by the development of four new adsorbents, members of the "Amberlite" family of synthetic resins, which unlock new concepts of ion exchange performance.

A description of how the process works, chart and tabular presentations of operational data, concise application information, a glossary, and a complete bibliography make the publication of considerable value.

One presentation is a two-color projection which shows, three-dimensionally, the operating capacity of each of the six "Amberlites" in relation to the pH of the media. The manner of presentation is interesting for no longer can relative acidity or alkalinity limit the usefulness of ion exchange.

Starting with a history of ion exchange, the publication tells what ions are, how ion exchange works, and what major processes it implements. The booklet describes the properties of the new "Amberlites," and outlines the fields of purification, isolation, and separation in which they prove most useful. Detailed characteristics such as the density, particle size, physical and chemical stability, flow-rate and backwash characteristics are presented tabularly. Another table gives the suggested operating characteristics for each exchanger—pH range, regeneration concentration, exchange capacity and rinse requirements. The work also reviews the operations in which ion exchange resins have distinguished themselves such as the purification of water, the removal of contaminants, the production of pharmaceuticals, and the use of the resins as actual therapeutic agents. Mixed-bed deionization, a new contribution to the chemical process industries, is explained. A glossary adds to the value of the booklet.

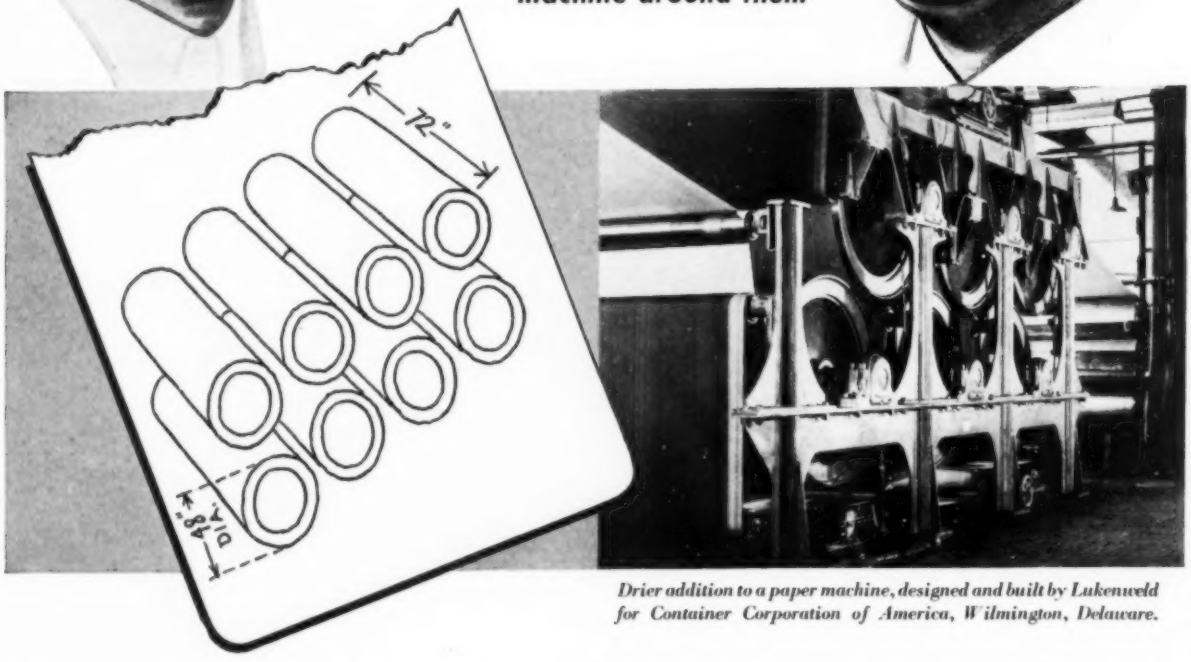
Copies of the Volume IX, No. 4 issue of "The Resinous Reporter" are available from the company by writing.

### Eye-Washing Fountain

There are many cases where slight or serious eye damages occur in plants making soaps, sanitary chemicals and other items. Alkalies, acids, vapors and irritating dusts are all dangerous. Quick application of water is essential to most accidental entry of these in the eyes. The eye-washing fountain, made by Benson & Associates, Chicago, is especially designed to reduce and eliminate serious eye damage. The fountain is operated by the resting of the forehead on the push valve, thus leaving both hands free to open the eyelids.

*"EIGHT cast-iron, single-shell drier rolls are needed..."*

*"SIX jacketed drier rolls will do it, and Lukenweld will build the machine around them"*




*Drier addition to a paper machine, designed and built by Lukenweld for Container Corporation of America, Wilmington, Delaware.*

● To increase the output from one of Container Corporation's paper machines, it was estimated that eight cast-iron, single-shell rolls would be needed to provide the additional drying capacity. Space was limited, so that was a factor.

Lukenweld determined that *six* Lukenweld Jacketed Drier Rolls would accomplish the same results as the eight cast-iron rolls. This would require less space, simplify the supporting structure and reduce costs. Lukenweld designed and built the machine to house and drive the rolls accordingly.

That machine is shown in this photograph at work in their plant—a compact unit packing a lot of production into small space. It is of welded plate construction, providing high strength and increased rigidity with minimum weight.

We at Lukenweld like to take ideas developed by your engineers and operating men and make them materialize. As designers and manufacturers of complete drying machinery, we are well acquainted with drying work in many industries.

May we talk with you about your drying or production design requirements? Write Lukenweld, Division of Lukens Steel Co., 446 Lukens Bldg., Coatesville, Pa.

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**DESIGNERS, ENGINEERS AND MANUFACTURERS OF MACHINERY**

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

### Acquires Oakes Mixer

American Machine & Foundry Co., New York, recently announced that they have acquired the manufacturing and leasing rights to the Oakes continuous automatic mixer. The Oakes mixer occupies eight square feet of floor space and has production capacities up to 6,000 pounds per hour depending on the material to be mixed. With the new machine materials to be mixed are pumped into the mixing head where a variable speed rotor provides the necessary mixing while the desired air is incorporated under pressure.

### Condensate System Bulletin

Publication of four-page specification bulletin on the new "CBA" high differential high pressure condensate return system was announced during August by Cochrane Corp., Philadelphia. The company has developed the new unit. It gives added capacity with lower horsepower motor ratings and can be used for return of condensate to higher pressure boilers in the 100 to 150 psi range of lighter pressure differential than was formerly possible. In addition to material and operating specifications, capacity ratings are given in the bulletin for six different sizes. Differential pressures of from 50 to 200 psi are listed and capacities for each unit are tabulated after each differential pressure for unit inlet pressures varying from 0-39 psi, 40-99 psi and for over 100 psi. A two-page dimensional drawing in color shows the design and construction of the new unit. Copies of the bulletin are available upon request.

### Overhaul Filter in A Day

The story of how a complete Alsop filter unit was repaired and completely overhauled in one day by Alsop Engineering Corp., Milldale, Conn., was told recently in a front page article of the *Southington* (Conn.) *News*. The filter unit, owned by Ingraham Research Laboratories, East Stroudsburg, Pa., was flown on Aug. 9 to Southington and thence taken to the Alsop plant in Milldale. Arriving in Southington at 10:45 a.m., the unit was completely repaired and overhauled and put back aboard the plane for Stroudsburg at 3:30 p.m. on the same day.

### New Kessler Booklet

"Polythylene Glycol Esters" is the title of a new 28-page and cover booklet recently issued by Kessler Chemical Co., Philadelphia. The booklet gives a general description of the esters, their physical properties, uses, suggested formulas and potential applications. Non-ionic surface active agents, the polyethylene glycol esters, are stable in the presence of considerable amounts of acids, alkalies or salts, and are thus suitable for use in insecticides, polishes, cosmetics, etc. Copies of the booklet are available by writing the company at State Road and Cottman Ave., Philadelphia 35, Pa.

### New Esso Solvent

"Brymul A," an emulsifiable petroleum solvent made by Esso-Standard Oil Co. of New Jersey, New York, is discussed in a recent issue of Esso *Oilways*, house magazine of the company. Properties and uses of this new type solvent that is a straight hydrocarbon of the Stoddard type, having a minimum flash point of 100° F, are covered in the article, which is entitled, "Industry Puts Brymul on the Spot."

### Speed Reducers

A folder on the new "Winsmith" differential speed reducer was issued recently by Winfield H. Smith Corp., Springville, N. Y. The folder explains and illustrates with cut-away and "explosion" photographs the new speed reducers of the company. Close-ups and descriptions of various parts of the equipment are also shown. The six models in the line are illustrated.

### Gummed Tape Use Book

A 64-page bulletin, entitled "Gummed Tape User's handbook" by Mills W. Waggoner, was published recently by Better Packages, Inc., Shelton, Conn. The book is a guide to more efficient selection, moistening and application and care of gummed tape machines. Copies are available for 50 cents.

### Koppers Offers BMU

The chemical division of Koppers Co., Pittsburgh, is offering beta-methyl umbelliferone, the "white dye" or whitening agent which is of wide interest to the soap industry.

Koppers beta-methyl umbelliferone is a white to light yellow crystalline solid. This synthetic organic chemical is a coumarin derivative and undergoes many of the reactions typical of this class of compounds. The material exhibits a marked blue fluorescence when illuminated by sunlight or other light sources. This fluorescence is more pronounced with alkali solutions.

Beta-methyl umbelliferone, as produced by Koppers, is soluble to the extent of about one-half part per 100 parts of water. It is soluble in 95 percent ethanol to the extent of 20 parts per 100 parts of solution at the boiling point, and to the extent of five parts per 100 at 20°C. Solubility in water-ethanol solutions is proportional to the ethanol content. It is very soluble in seven percent aqueous sodium hydroxide solutions, is somewhat less soluble in sodium carbonate solutions, and is only slightly soluble in sodium bicarbonate solutions.

The blue fluorescence which it exhibits can be used to mask yellow discoloration of solution and of solid materials such as soaps and cleaning compounds. This fluorescence suggests similar applications in plastics, resins, waxes, surface coatings and textile goods. In soap it is particularly useful as a whitening agent or "optical bleach" for use with soap powder and flakes, and with bar soap.

### New Perfuming Material

New sources for the manufacture of two important perfuming materials, nerolidol and farnesol were developed recently in the laboratories of L. Givaudan & Cie. of Geneva, Switzerland, and the materials are now available in the United States through Givaudan-Delawanna, Inc., New York. Nerolidol and farnesol, the oils from which they are produced, and uses of these aromatics are described in detail in the current issue of the *Givaudanian* house magazine of the company.

## SOAP PLANT OBSERVER

**By John W. McCutcheon**

LAST month a few general notes were made on continuous soap processes and specific mention was made of the Sharples process as in use by one soap concern. The second method of continuous soap making is in use by two other large soap makers and is the opposite of the previously described method in that the oil is first hydrolysed to fatty acid and glycerine and then purified and reacted with caustic to form a soap which is free from glycerine and is the equivalent in every way of a normal boiled soap. The second process in some respects is more simple and direct in its application and more versatile in its use.

The oils and fats are first mixed in the proper proportions to agree with the final formula desired for the soap. The oil, heated at about 500°F, is then forced under a pressure of about 725 psi into the lower portion of a splitting column. Hot water, also under pressure, is forced into the upper portion of the column. At the pressures and temperatures used, the oil and water become partially miscible and react to form glycerine, water and fatty acids in the presence of a zinc oxide catalyst. The fatty acids, split to the extent of 98 percent or more, are drawn from the top of the column and may or may not be purified by distillation, after which they are fed into a proportioning pump to a mixing device along with the proper strength and amount of caustic soda for complete saponification. This latter operation functions in a manner similar to jet saponifica tion with the difference that fatty acids are used and no glycerine is present in the soap. By adding a little salt to the caustic soda, and by diluting its strength with water to the proper amount, a toilet soap can be made which is the equivalent of that formed under the best kettle house practice and can be used interchangeably with it if desired. Since the process is the product of a number of different developments such as continuous distillation, high pressure hydrolysis, jet saponification, plus the coordinating equipment necessary to unite these operations into one single unit, it is to be expected that the patent situation would be very complex. Certain parts of the process can be licensed under the original patents, others cannot, while some other parts of the process have been known so long that patent consideration need only be taken into account where special equipment design is a factor.

Before leaving this type of processing there are several aspects to which special attention should be drawn. First, the glycerine recovery is greatly simplified. The sweetwater containing about 20-25 percent glycerine is withdrawn from the bottom of the reactor and flash evaporated to an 88 percent crude without application of further heat. The salt content is nil, of course, and further concentration to dynamite and C. P. grades may be carried out quite readily. Secondly, the soap making method has a great deal of flexibility. For example, by using relatively pure starting oils it is possible to make a normal laundry soap or powder from the split fatty acids without going through the distillation step. Thirdly, by using distillation as a purifying step, it is possible to up-grade stocks very considerably by increasing the fraction continuously withdrawn from the still pot. This material could conceivably be up to 20 percent or more and would no more represent a loss than would foots formed in a refining operation which would be degraded to a lower quality soap. Distillation in this process therefore may be looked upon as a convenient integrated purifying step which can be used to control the normal variation in the starting raw materials. In addition, the process gives a variable control of the final product not possible by normal boiling, where water-salt- and soap are in phase equilibrium. At the high temperatures of operation available, soaps may be formed with practically any desired moisture content so that subsequent processing may be greatly simplified, such as spray drying etc.

For example, by injecting 7000 lbs. of fatty acids per hour at an acid value of 210 into the mixing chamber along with 2100 lbs. of 50 percent caustic soda solution per hour, the resultant neutral soap would have a moisture content of approximately 16.7 percent. If 4200 lbs. per hour of 25 percent caustic soda solution is injected, the resultant neutral soap would have a moisture content of approximately 32.4 percent. Caustic potash or other alkalis may replace part of the caustic soda also, a variation not possible where boiling operations are involved.

The drawbacks to the system, outside difficulties of initial cost and licensing fees where available, are the necessity for developing a highly skilled personnel to maintain perfect control at all times, the necessity of operating on a scale sufficiently large and uniform for overall economy, plus the need of auxiliary equipment such as secondary batch stills to maintain continuity in the process.

Many other rapid methods of soap making are grouped for convenience below. Certain of them such as the Clayton Continuous Process (U. S. Patents 2,249,676, 2,343,829) have been highly successful in large scale operation. This process saponifies the oil and removes the glycerine and water by spraying the super heated mass into a chamber having a reduced pressure.

Another method which makes substantially anhydrous soap is to reflux the oil and anhydrous caustic in an inert solvent such as kerosene (U. S. Pat. 1,813,454) and then spray dry to remove the solvent and the water formed in the reaction. (U. S. Patent 2,380,650).

Another method is to reflux an oil or fat with an alcohol such as

methyl alcohol in the presence of 0.1 to 0.5 percent sodium hydroxide as a catalyst. Separate and distil the esters, saponify them with alkali and recover the liberated alcohol for reuse in the first stage of the operation (U. S. Patent 2,271,619).

* * *

**SYNTHETIC detergents continue prominently in the news items. Slight price advances on industrial products were noted on many items about the middle of the year, but recently a number have reverted to former levels. Price trend in this field appears fairly steady on all types. A rush of new products has been noted, notably in the emulsifying field. A list of 534 compounds one year ago has increased to 724. Of these 50 have been discontinued leaving a net increase of 26 percent. Continued expansion is noted in compounded products containing CMC for industrial and repackaging use. One sample received some months ago in a retail package was so hydroscopic that it had turned from a powder to a solid lump. Several others had dampened through the carton. Too much care cannot be exercised in shelf testing new products.**

**A recent bulletin by the Atlas Powder Co. called "Atlas Surface Active Agents" has come to hand. One interesting feature is the detailed discussion on how to choose an emulsifying agent from the Hydrophile-Likophile balance. Working examples are given illustrating the use of extensive tables of data to accomplish this purpose. Atlas is to be commended on the clear scientific approach to this problem. It is unfortunate that there is not some working committee set up in the soap industry to remove some of the mumbo jumbo that exists in this field. The committee should set up standards of comparison and analysis between types of compounds much in the same manner as has been done by the American Oil Chemists' Society for soaps. Such an approach should prove of great value in expanding the utility of such products. It may be broadly stated that wherever a chemical reaction takes place at an interface, surface active materials may be made to play a part. In a recent article (1) [P. H. Cardwell & Martinez, "Ind. & Eng. Chem." V. 40, #10, P. 1951 (1948)] it was shown that such an agent improved the contact of acid inhibitors to such an extent that overall results were improved 30 to 40 percent.**

## Soaps, Detergents Topics for A.O.C.S. Meeting

SOAP and detergents, the analytical aspects of oil chemistry, industrial uses of fatty oils and acids, research and antioxidants are among the major topics of discussion for the fall meeting of the American Oil Chemists Society, being held Nov. 15-18 at the Hotel Pennsylvania, New York, according to a recent announcement from the A.O.C.S. Nutritional aspects of glyceridic and edible oils are also listed for consideration at the meeting. One paper covering the general subject of "Soap vs. Synthetic Detergents" was assigned to Dr. Foster D. Snell of Foster D. Snell, Inc., New York, general chairman of the meeting. The opening session, Monday morning, Nov. 15, is being devoted to the presentation of five papers on soaps and detergents.

Because of the large number of papers being read at the gathering, for which an attendance of 1,000 is expected, for the first time the convention is being divided into sections and simultaneous sessions are being held.

Technical committee reports, being read by the chairman of the respective committees, include those on Soap Analysis by L. K. Whyte of Colgate-Palmolive-Peet Co., Jersey City, N. J.; Glycerine Analysis by J. T. R. Andrews of Procter & Gamble Co., Cincinnati; Fat and Oil Analysis by V. C. Mehlenbacher of Swift & Co., Chicago; Oil Color by Procter Thomson of Procter & Gamble Co., Cincinnati.

In addition to discussion sessions, exhibits totaling more than 50 are anticipated for the first meeting of the society to be held in New York in more than 10 years. An extensive entertainment program, including special trips for the women under the direction of Dr. Cornelia T. Snell has been planned. Plant tours have also been arranged for convention attendants.

### Will Bulletin Appears

Two models of the new line of Bausch & Lomb, wide-field, stereoscopic microscopes are described in the October issue (No. 104) of *Laboratory Equipment Bulletin*, published bimonthly by Will Corp., Rochester 3, N. Y. The bulletin gives the latest information on the Beckman Flame Spectrophotometers, recently improved by the adaption of a heated spray chamber and concentric type atomizer. Also discussed are the "Precision" senior model "Mag-Mix" magnetic stirrer, and "Glass Col" heating mantles made of quartz. Bulletin 104 will be sent by the firm on request.

### Detergents for Textiles

Committee reports of research committees of the American Association of Textile Chemists and Colorists on "The Evaluation of Detergents for Wool" and "Resistance to Insect Pests" were presented by Clarence L. Nutting of Arlington Mills, and H. E. Wilde of Merck & Co., at the annual meeting of the A.A.T.C.&C. held Oct. 21-23 in Augusta, Ga. Henry F. Herrmann, president of the organization, presided, and reviewed the activities and progress of the association.

Tests with 15 soaps and 35 synthetic detergents were reported by a group of women from the U. S. Bureau of Human Nutrition and Home Economics.

### Wolf Disinfectant Chmn.

Dr. Paul A. Wolf of the biochemical research laboratories of Dow Chemical Co., Midland, Mich. has just been appointed chairman of the Disinfectant Scientific Committee of the National Asociation of Insecticide & Disinfectant Manufacturers.

# PRODUCTS AND PROCESSES

### Cold Process Soap

A suitable quantity of rosin is dissolved in a mixture of oils and greases and the whole mixed well and allowed to cool. Caustic potash solution is then added in an amount insufficient for complete saponification. This is then added to palm-kernel oil which has been mixed with a suitable quantity of caustic soda solution. The whole is mixed and allowed to stand. Weak caustic soda solution is added to complete saponification. The soap is discharged into cooling frames. British Patent No. 575,947.

### Homogeneous Potash Soap

Potassium soap free of alkali hydroxides and carbonates stays homogenous even at fluctuations from plus 40° to -20°C., but takes on a softer consistency by the presence of glycerol or polyglycerol aliphatic esters having one or more nonesterified hydroxy groups. These may be added or formed in the soap by heating for several hours just under the boiling point, with less than the equivalent quantity of caustic potash. For example, soybean-oil acids five, palm-oils acids 10, and coconut oil 23 kilograms, are saponified with 17.5 kilograms of caustic potash of 50°Be. after addition of sodium sulfate one, sodium chloride one, water 37, and sodium sulfonate 2.5 kilograms. After saponification about three kg. of partial fatty glycerol ester are added. M. J. H. E. Hustinx, Dutch Patent No. 61,132; through *Chem. Abs.*

### Rapid Saponification

Peanut oil and its methyl esters were both saponified in the same manner at different temperatures with soda lye of 25°Be., with vigorous stirring. Saponification was much more rapid with the methyl esters than with the glyceride. At 80° and 100°C. the methyl esters were saponified in a few minutes, but the glyceride required over 5 hours. O. Micaelli, M. Naudet, and P. Desnuelle, *Bull mens. ITERG* 1948, No. 4, 36; through *Chem. Abs.*

### Degreasing Emulsion

A mixture for degreasing metals contains a chlorinated aliphatic hydrocarbon melting below 10°C., an alcohol having no more than six carbon atoms, and a ketone of the same chain length as the alcohol. Waxes may be present to give the metal a protective coating, emulsified by soap or sulfonated alcohol in an aqueous medium. Solvay & Cie, French Patent No. 861,366.

### Bleaching Agents

Such substances as yellow laundry soap, soybean oil, and oleic acid can be bleached with equal molar mixtures of chlorite and aldehyde at a pH of 7. A number of aldehydes are suitable. C. A. Hampel, to Mathieson Alkali Works, Inc. U. S. Patent No. 2,430,674.

### Glycerol Recovery

An improved process for recovering glycerol and polyglycerols from glycerol foots provides for treatment of the foots with an alcohol of three-six carbon atoms. The glycerol is miscible with the alcohol but the polyglycerols are insoluble at the temperature of treatment. For treating glycerol foots resulting from distillation of crude glycerol obtained from spent lye in a soap-making process, the foots are extracted with an alcohol of not more than two carbon atoms so that both glycerol and polyglycerols are dissolved. The glycerol is then separated from the polyglycerols by means of a three-six carbon alcohol.

Temperatures of 70-90°C. are used for propanol and butanol, and of 90-110 °for pentanol and hexanol. The process is operable in the presence of as much as 10 per cent of water, based on the volume of alcohol used. G. I. Keim, J. Ross, and J. H. Percy, to Colgate-Palmolive-Peet Co. U. S. Patent No. 2,444,296.

### Oil Shampoos

An oil shampoo is relatively high in free oil content; this is supposed to lubricate the hair as well as clean it. Mineral oil should be limited to a small amount, if used. The following are representative formulas:

| | *Parts by Weight* |
|---|---|
| Sulfonated castor oil | 78 |
| Light mineral oil | 3 |
| Glycerine | 4 |
| Water | 15 |
| Perfume and preservative, to suit | |

| | *Parts by Weight* |
|---|---|
| Castor oil | 75 |
| Castor oil fatty acids | 6 |
| Alcohol | 9 |
| Glycerine | 5 |
| Triethanolamine | 2 |
| Ethyl oleate | 3 |
| Perfume and preservative, to suit | |

*Soap, Perfumery, Cosmetics* 21, 800 (1948).

### Tough Bubbles

Tougher and longer lasting bubbles can be made by adding glycerine or sugar to solutions of an agent such as "Aerosol OT." Glycerine not only increases viscosity but prevents drying out. Addition of both glycerine and sugar causes an enormous increase in the life of the bubbles, a good example of synergism. A. L. Kuehner, *J. Chem. Education* 25, 211 (1948).

### Shoe Polish

A shoe polish contains 65 per cent of carnauba wax, 15 of ceresin, three of ethylene glycol, seven of rosin, six of turpentine, and six per cent of coloring matter. G. Stern, Italian Patent No. 416,497.

### Drycleaning Additive

Salts of water-soluble organic amines with olefinic compounds, obtained by a nitrosation-sulfitation process, are soluble in water and in water-immiscible solvents. The salts are surface-active and promote water-in-oil emulsions for dry-cleaning. L. J. Beckham and W. A. Fessler, to Allied Chemical & Dye Corp. U. S. Patent No. 2,443,716.

# NEW PATENTS

*Conducted by*
**Lancaster, Allwine & Rommel**

PATENTS, TRADEMARKS AND COPYRIGHTS

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**No. 2,448,661, Method of Preparing Parasiticides Containing Aluminum Hydroxide**, patented September 7, 1948 by Homer L. Cupples, Alexandria, Va., dedicated to the free use of the people in the territory of the United States. A process of preparing parasiticides, is patented comprising the mixing of xanthone, a vegetable gum, aluminum sulphate, water, and ammonium hydroxide, the latter three ingredients being in the proportion of about 60 milliliters of 10 percent aluminum sulphate, to about 2835 millliters of water, to about 55 millliters of ammonium hydroxide (specific gravity 0.90 diluted from one to ten volumes), thereby precipitating aluminum hydroxide in situ.

**No. 2,448,665, Low-Temperature Noncrystallizing DDT - Alkylated Naphthalene Insecticide**, patented September 7, 1948 by Elmer E. Fleck, Silver Spring, and Robert K. Preston, Cumberland, Md.; dedicated to the free use of the people in the territory of the United States. An insecticidal composition is covered which will remain free from crystal formation of DDT at all temperatures between about —20°F. and 140°F. comprising a solution of about from 95 to 80 parts, by weight, of a kerosene mixture of DDT and about from five to 20 parts, by weight, of substantially pure alkylated naphthalenes, said kersosene mixture containing about from three to 10 percent DDT.

**No. 2,448,910, Chlorinated Paraffin Wax Amines for Controlling Fungi and Bacteria**, patented September 7, 1948 by Thomas E. Reamer, Albany, Calif., assignor to Shell Development Company, San Francisco, Calif., a corporation of Delaware. A method of controlling fungi and bacteria is patented comprising exposing them to mixtures of aliphatic compounds having at least 12 carbon atoms and not more than about 40 carbon atoms and containing per average molecule more than one amino group, at least one olefinic double bond, combined chlorine only in the form of 0.5 to 1.5 non-ionizable chlorine atoms, and an oleophilic hydrocarbon chain of at least eight carbon atoms linked in an amino group.

**No. 2,449,028, Process of Comminuting Impure DDT**, patented September 7, 1948 by Isaac F. Walker, Hockessin, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corpration of Delaware. A process is claimed which comprises comminuting in a high velocity gas disintegrator impure, 1, 1,1-trichloro-2,2-bis(p-chlorophenyl) ethane having a setting point of from 102 to 106°C. in the presence of a salt of an acid having an ionization constant of at least $3x10^{-7}$ at 25°C.

**No. 2,449,274, Self - Indicating Quaternary Ammonium Bactericidal Composition**, patented September 14, 1948 by Harry R. Broll, Baltimore, Md., assignor to Fuid Bros., Inc.,

Baltimore, Md., a corporation of Maryland. A bactericidal composition is covered comprising a bactericidal quaternary ammonium compound and a fluorescent indicating agent quenched therein and responsive at a predetermined reduced bactericidal strength to change the visual aspect of the composition, said indicating agent being selected from the group consisting of fluorescein and uranine.

**No. 2,449,533, Synergistic Insecticidal Compositions**, patented September 14, 1948 Edward R. McGovran, Hyattsville, Md., Elmer L. Mayer, Anaheim. Cailf., and Florence B. Talley, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture. An insecticidal composition is patented comprising an insecticidal nicotine compound and phthalonitrile as a synergist therefor.

**No. 2,449,671, Pyrethrum Extract and Propellant Solution Containing it**, patented September 21, 1948 by William W. Rhodes, Westtown, Pa., assignor to Kinetic Chemicals, Inc., Wilmington, Del., a corporation of Delaware. An extract is covered consisting of a fluorinated solvent from the class consisting of CHClF and $C_2HClF$, the boiling point of which is —10.2°C. and the parts of pyrethrum flowers soluble therein.

## Soap in Pinene

Systems of sodium oleate and sodium stearate in pinene, become more opaque with time, during setting of the gels, for concentrations of soap of 0.08, 0.09, and 0.10 gram in 10 ml. of pinene. The opacity of systems of sodium palmitate in pinene does not change during the process of gel formation for concentrations of soap of 0.045, 0.055, and 0.065 gram in 10 ml. of pinene. G. S. Hattiangdi, *Proc. Indian Acad. Sci. 27A*, 23-8 (1948); through *Chem. Abs.*

## Soap Making in India

India has about 86 soap factories. About 26 of these have modern equipment, with a capacity of 130,000 tons of soap per year. These factories employ the full boiling process and produce good quality soaps commanding a wide market. About 60 medium-sized factories employ the semi-boiled or cold process. These have a total capacity of 30,000 tons annually. Also numerous cottage-scale plants exist, perhaps as many as 5000. They use crude equipment and produce soap of indifferent quality. Much planning is needed for the soap industry in India so that it may become an important industry and soap imports can be greatly reduced. K. L. Wahi, *Soap Perfumery, Cosmetics* 21, 801-4 (1948).

## Catalytic Bleaching

Palm oil is quickly bleached by air in the presence of a small amount of manganese, nickel, lead, cobalt, or copper soap, the first three being the most effective. The presence of 0.5 per cent of manganese soap shortens by two-thirds the time required for bleaching a pale yellow oil. J. Mikumo, *J. Soc. Chem. Ind. Japan* 46, 984-5; through *Chem. Abs.*

## Laundering in Hard Water

Soda ash dissolved in the wash liquor during laundering will not remove calcium oleate which has been deposited on fabrics, and will not prevent soap losses when hard water is used. P. Anglaret, *Teintex* 13, 239-45 (1948); through *Chem. Abs.*

## Nature of Detergency

The adhesion of dirt to the surface of fibers involves factors such as the operation of electrostatic forces, as well as adhesion by means of an aqueous or oily cement. Dirt particles such as quartz or sand, may be relatively hydrophilic or hydrophobic such as carbon black or sand particles coated with waxes or grease. Resilience of the fibrils must play a large part in entrapping particles. Protein fibers are especially resilient, then follow the vinyl derivatives. Cellulose, owing to hydrogen bonding between the chains, is not very resilient. Organic compounds may be attached to polar portions of the fiber by ionic or by hydrogen bonding, or by purely dispersive forces. Soil containing fats and fatty acids, which under autoxidation involves polymerization, is extremely difficult to remove.

Removal of hydrophilic material such as quartz is analogous to a flotation process; the particles are rendered hydrophobic on the surface, so that they can be carried away by air bubbles or injected into a hydrocarbon oil emulsion droplet. Removal of waxes adsorbed into the fabric is more complex. Penetration of the hydrophobic portion of the detergent into the wax is possible; its surface is thus made hydrophilic, and permits the entrance of the detergent solution into wax-coated pores of the fabric.

The nature of the substrate is important, as well as its pore size. As a detergent solution penetrates a pore of the fabric, adsorption on the walls of the pore renders the solution progressively weaker or more dilute. Removal of liberated material in the form of foam is more economical than removal by emulsification. E. K. Rideal, *Chem. and Industry* 1948, 403, 409.

## Soap Perfume Ingredients

Incorporation of perfumes in soaps and shampoos requires careful study of fixatives. Perfume stability is demanded in spite of the use of a small amount of inexpensive perfume material. The effect of about 15 per cent of perfume proper can be enhanced when combined with 60-65 per cent of naphthalene and 20-25 per cent of benzyl benzoate, diethyl phthalate, or dinitrobenzene, or their mixtures. The naphthalene masks the soapy odor, and its odor is masked in turn by the fixatives, thus bringing out the perfume note without any part of the real perfume being required to counteract the soap odor. Naphthalene and the fixatives have relatively little positive odor of their own. T. Ruemele, *Perfumery & Essen. Oil Record* 39, 223-4, 238 (1948).

## Partial Hydrolysis

Development of acidity in soap stocks after the usual treatment with salt water is attributed to a partial hydrolysis of the triglycerides caused by the soaps present. The liberated glycerol reacts with the triglycerides and forms mono- and diglycerides. To test this theory a stock treated with salt water for 30 minutes was dissolved in dilute alcohol and extracted with petroleum ether. The residue after evaporation of the petroleum ether shows a hydrolysis number of 22.4. It was neutralized, dissolved in chloroform, and separated chromatographically. The last fraction eluted with alcohol showed a hydroxyl number of 130, which indicates the presence of monoglyceride. P. Desnuelle, M. Naudet, and J. Rouzier, *Bull. mens. ITERG* 1947, No. 7, 28; through *Chem. Abs.*

## Mono- or Diglycerides

Saturated mono- and (or) diglycerides are prepared by the catalytic interesterification of fats. Thus, treating palm oil with sodium hydroxide in glycerol at 170°F. gives a mixture of mono- and diglycerides. When these are treated with sodium methoxide in xylene at 100°F., they rearrange and some crystallization occurs. Separation of the mixture by crystallization from petroleum ether gives a 36 per cent yield of solid glycerides with a hydroxyl number of 242, and 72 per cent of liquid glycerides with a hydroxyl number of 75. E. W. Eckey, to Procter & Gamble Co. U. S. Patent No. 2, 442, 534.

## Micelle Thickness

A newly found x-ray diffraction band, obtained from aqueous solutions of soaps and detergents, gives a Bragg spacing which is independent of concentration and which is close to the double-length of the molecule. This is designated the micelle thickness or M-band.

The experimental results lead to the idea of a micelle being cylindrical rather than lamellar or spherical. The micelle exhibits the following characteristics: (1) A micelle consists of one double layer of soap or detergent molecules. These have their polar ends oriented outward toward the water and their nonpolar ends inward toward each other. (2) The thickness of the micelle of a pure soap is essentially twice the length of the soap molecule, independent of concentration. (3) Hydrocarbons solubilize inside the micelle between the two layers of soap molecules and then make the micelle thicker. (4) The area per soap molecule in the micelle remains practically constant, whether or not solubilized hydrocarbons are present. (5) The width or lateral dimension of the micelle and the number of soap molecules per micelle increase with increasing soap concentration and with solubilization of hydrocarbons. (6) From energy considerations the area of contact between the hydrocarbon chains of the detergent molecules and the water must be as small as is compatible with the other conditions imposed on its structure. R. W. Mattoon, R. S. Stearns, and W. D. Harkins, *J. Chem. Physics* 16, 644-58 (1948).

## Damaged Oil Seeds

Weather damage to soybeans results in variation in percentages of oil, protein, and ash. A marked increase occurs in the percentage of crude protein. Oil percentages were sometimes higher and sometimes lower in the damaged portions. The iodine number of the oil was usually but slightly affected; the acid number was higher in the damaged seeds. O. A. Krober and F. I. Collins, *J. Am. Oil Chemists' Soc.* 25, 296-8 (1948).

# SANITARY PRODUCTS
## A SECTION OF SOAP

INTERESTING is a comment made recently by a speaker before the Synthetic Organic Chemical Manufacturers Association in regard to the current younger generation of salesmen. For the past ten years, at least as far as chemical products are concerned, we have had a sellers' market. Selling has been relatively easy,—and this is the only kind of selling which the current group of younger salesmen really know. They have never had the tough going which marked the life of all salesmen back in the dark and dreary middle nineteen thirties. Soon, they may be called upon to meet similar sales conditions, or at least conditions less rosy than those of recent years. Obviously, the direction of sales training must and should take these possible developments into consideration. Being ready for the big wind, if and when it comes, is half the battle in weathering a storm.

FROM out of the gloom on the household insecticide horizon, we imagine that we can see a ray or two of sunshine breaking through. Several manufacturers of insect sprays, aerosols, and allied household products confided to us that 1948 was not such a bad season after all. In fact, two of the more progressive merchandisers said that 1948 was a pretty good year based on the averages of the past twenty years. With the 1946 and 1947 seasons, the worst in the industry history, just behind us, maybe not too much has been expected of 1948. Any sort of improvement was undoubtedly a pleasant surprise.

As we look back over the reports for 1948 sales, it would appear that those firms which refused to sit back and wait for business to improve, but who went out after sales aggressively, did pretty well. In short, the business was there for those who would and did go after it. But for those who took it for granted that 1948 was going to be a repetition of 1946 and 1947, we imagine that sales were not too encouraging.

Frankly, with a half-dozen outstanding exceptions, the merchandisers of household insecticides this year reminded us of a football team that quit before it ever went on the field. And we believe that those firms which did sell harder this past year, did considerable business at the expense of their lethargic competitors. Again, we insist that the household insecticide business is not dead, as some of our less optimistic friends in the industry believe. We will stick our necks out again and predict that much of the junk which has been kicking around has been cleaned out, and 1949 will be a good insecticide year. But, it will be a good year only for those who get out and hustle, and not for those who sit back and groan how lousy business is.

AS business has slowed down in some of the sanitary specialties during the past month or two, an inclination to cut prices has been noted. In some instances costs will permit this, but in others they will not. If more of an item can be sold at the lower price,—that is if high price has been a road-block to wider sales,—then some justification may exist. But in most instances we have heard about, this condition does not exist. Cuts come right out of already narrowed profit margins. And we question that they stimulate sales one iota. In department store bargain sales of household items, or gloves or shoes, or hats,—maybe yes, but in sanitary products to industrial and institutional users,—positively and definitely no! Unjustified price cuts in these latter cases are no stimulant to sales, and never have been. Experience proves that they are only the start of a vicious circle which eventually turns profit to loss. A price cut should be the last competitive gesture, not the first.

# Resistance of House Flies

**By George W. Barber, Ordway Starnes**
Department of Entomology,

### Introduction

PAST entomological experience has shown that species of insects had become resistant to insecticides applied in the field, probably as a result of natural selection. It was possible that the house fly, *Musca domestica L.*, might become resistant to residual or other sprays which at present were used successfully against it. It was possible also that the insect might become successfully resistant to different insecticides that would be used against it. Therefore, we might find ourselves one day without chemical weapons with which to control the insect.

With these considerations in mind it appeared desirable to determine whether laboratory lines of flies would become resistant to each of several insecticides when applied to flies of successive generations. Experiments on this subject were begun in October, 1947.

### Procedure

THE current laboratory line of flies was obtained on February 21, 1947 from the Orlando, Florida laboratory. This line was reported to have originated from flies collected at a local Orlando dairy in the summer of 1943. The puparia of a jar culture of the 13th generation at Rutgers, set up on September 30, and consisting of 2209 normal puparia, the average weight of which was 20 mg., was divided into four equal parts. According to plan the flies of one lot were to be treated for 10 successive generations with DDT, the flies of a second lot were to be treated with pyrethrum, the flies of a third lot were to be treated with extractives of a botanical, and the flies of the fourth lot were to serve as checks, the breeders of which would not be treated with an insecticide. The flies of each lot were placed in an oviposition cage which was used exclusively thereafter for successive generations of that line of flies. The four lots of flies mentioned were the parents of four new lines, each of which received a given treatment. Although the parent flies were treated with the appropriate insecticide, the experiment consisted of the treatment, culturing and observation of the succeeding ten generations.

In these experiments it was desirable to apply the insecticides in such a way that each individual received an identical dosage of the material and so that no fly of the three lines to be treated with insecticides would escape treatment. The measured drop technique met these requirements most satisfactorily.

The sources of the insecticides used were as follows: pp' isomer of DDT from Geigy Company, extract containing 20 per cent pyrethrins from S. B. Penick Company, and extractives of a botanical, Code Number 7R2651, from Merck and Co. Inc.

In preliminary experiments the dosage of each insecticide necessary to cause mortality of 50 per cent of the flies (LD 50) had been determined. This dosage was 10 mg. per kg. for DDT, 50 mg. per kg. for pyrethrum, and 30 mg. per kg. for the extractives of the botanical used. The insecticides were prepared as solutions in acetone and concentrations were formulated so that each fly received a dosage of 0.002 ml. of the mixture.

Micro-injection apparatus calibrated to deliver 0.002 ml. of the material per drop was used. Each lot of flies was treated on about the fourth day after emergence. The flies that were dead and those that were on the floor of the cage were removed and discarded. The cage was placed in a container and the flies were knocked down with carbon dioxide, the time required being about one and one-half minutes. The knocked-down flies were then placed in a Buchner funnel, which was connected to allow a gently- flowing stream of $CO_2$ to pass, in order to keep them immobilzed. The flies were then placed in petri dishes in lots of 10 or 20. A hypodermic needle, the point of which had been ground round was attached to the micro injection apparatus, and the standard dosage of 0.002 ml. of insecticide was applied to the thorax of each fly. Some of the treated flies were retained under petri dishes, where they were given squares of bread soaked in milk as food. The others were returned to the oviposition cages where they were given milk on cotton in saucers as food. Flies of the check line were

**TABLE I**

**Comparision of the rates of mortality of flies of the treated lines with that of flies of the check line when retained under petri dishes for 24 hours after treatment.**

| Generation | Deviation of the percentage mortality of flies of the lines treated with the following insecticides from that of flies of the check line that received the same treatments | | |
|---|---|---|---|
| | DDT | Pyrethrum | Botanical |
| 1 | 0 | 0 | 0 |
| 2 | —20.0 | +5.0 | —22.5 |
| 3 | —2.5 | —7.5 | +5.0 |
| 4 | —42.5 | —40.0 | —22.5 |
| 5 | —12.0 | —9.5 | —24.5 |
| 6 | —10.0 | —30.0 | —12.0 |
| 7 | —4.0 | —14.0 | —18.0 |
| 8 | —27.0 | —18.0 | —25.0 |
| 9 | —27.0 | —12.0 | —4.0 |
| 10 | —14.3 | +8.0 | —7.0 |
| Average | —13.9 | —11.8 | —13.0 |

[1] Journal Series paper of the New Jersey Agricultural Experiment Station, Rutgers, University, Department of Entomology.

[2] Research carried out in part with funds provided by the Office of the Quartermaster General, Department of the Army.

# TO INSECTICIDES [1, 2]

**and Eleanor B. Starnes**
Rutgers University

handled in a like manner. Groups of them were treated with each of the insecticides and retained under petri dishes, the rest of the colony having been returned to the breeding cage without treatment. In each case a reading of the rate of mortality at 24 hours after treatment was taken. One group of flies from each colony in each generation was treated with a dosage of 0.002 ml. of acetone, to serve as a check on their reaction to this material and to the $CO_2$ used to obtain immobilization.

Not including the parent generation, the following numbers of flies were treated and observed in these experiments: in the petri dish studies, 750 of the DDT line, 800 of the pyrethrum line, 800 of the botanical line; in the cage studies, 3492 of the DDT line, 3450 of the pyrethrum line, 3321 of the botanical line. A total of 880 flies of the check line were treated with each of the three insecticides in the petri dish studies.

Jelly glasses containing NAIDM larval medium were placed in the cages and the females that survived the treatments deposited their eggs therein. The eggs were placed in battery jars containing standard amounts of NAIDM larval medium and covered with squares of cloth. From one to three such jars were set up for each of the four lines of flies in each generation. When the puparia had been formed they were cleaned by washing in tepid water, they were counted and five lots of 100 each were weighed. The puparia of one jar culture were placed in the appropriate oviposition cage whereas those of other jar cultures of a given generation were placed in clean battery jars covered with squares of cheese cloth. Records of the rates of emergence of flies from the puparia of each jar culture were obtained by counts made after emergence was complete and when the flies were dead.

The total number of jar cultures and puparia studied during the 10 generations that constituted the experiment were: for the DDT line, 17 jars and 47,698 puparia; for the pyrethrum line, 20 jars and 48,586 puparia; for the botanical line, 19 jars and 51,214 puparia; and for the check line 19 jars and 53,359 puparia.

**TABLE II**

**Comparision of the rates of mortality of flies of the treated lines with that of flies of the check line when retained under petri dishes for 24 hours after treatment.**

| Generation | Deviation of the percentage mortality of flies of the lines treated with the following insecticides from that of flies of the check line that received the same treatments | | |
|---|---|---|---|
| | DDT | Pyrethrum | Botanical |
| 1 | +3.3 | +10.0 | +7.8 |
| 2 | —19.0 | —4.3 | —10.1 |
| 3 | +17.3 | +10.2 | —5.3 |
| 4 | —5.8 | —25.0 | +2.9 |
| 5 | +14.7 | +4.3 | —11.0 |
| 6 | —1.0 | —3.0 | —13.3 |
| 7 | +8.2 | —13.5 | —29.0 |
| 8 | —17.1 | —4.1 | —27.2 |
| 9 | —10.0 | —15.3 | —7.3 |
| 10 | —1.8 | —13.5 | —7.3 |
| Average | —1.1 | —5.4 | —9.9 |

### Results

*Rate of Mortality of Tested Flies*: In each generation the rates of mortality resulting from treatment with a given insecticide of flies of a treated line and flies of the check line were compared. If a smaller percentage of flies of a treated line was killed by the treatment appropriate to that line than was killed in the check it was considered that the former were more resistant to the insecticide than were the checks, whereas if the contrary were true they were considered not to show resistance. The results obtained by comparing the rates of mortality of treated flies in each of the treated colonies with the rate of mortality of flies of the check colony that received the same treatment are given, for flies retained under petri dishes in table 1, and for flies placed in the breeding cages in table 2. Except for flies of the line treated with DDT and retained in the oviposition cage, the data show that fewer flies of most generations in each treated line died in petri dishes or in cages than died in the checks. The preponderance of evidence from these data indicates that all three treated lines of flies were more resistant, on an average, than were flies of the check colony. The evidence appears to show that the flies of the treated lines had become measurably resistant to each of the insecticides by the second generation and maintained such resistance throughout the experiments.

### Weight of Puparia

THE results of weighing the puparia of all the jar cultures for ten generations were as follows:

| *Line of Flies* | *Weight per Puparium* Mg. |
|---|---|
| Check | 16 |
| Treated with DDT | 18 |
| Treated with Pyrethrum | 18 |
| Treated with extractive of a botanical | 18 |

### Rate of non-emergence

THE average rates of non-emergence of flies from puparia were as shown in table III. The data in table III show that in the cultures, the flies of which were treated with DDT, the average rate of non-emergence was 5.0 per cent greater than it was from puparia of the untreated checks, and that for cultures, the flies of which were

(*Turn to Page* 143)

# Testing the Quaternary Ammoniums

**Adrien S. DuBois**
Fuld Bros. Co.

THE literature on the chemical estimation of high-molecular weight quaternary ammonium compounds was reviewed two years ago (1). Although but a short time has elapsed, the continued attention paid by the Chemical Analysis Committee, Disinfectant Section, of the National Assn. of Insecticide and Disinfectant Mfgrs. to this particular subject, testifying to the sustained interest of the membership, prompted bringing the original survey up to date.

The activities of the Committee have led to the circularization (2), to the membership of the NAIDM, of two methods of evaluation; one for laboratory use; the other, for field testing. While the laboratory procedure seems to have received general acceptance, there is still no agreement on a satisfactory field test.

### *Bromphenol Blue Methods*

RECENT work by Gain and Lawrence (3) has demonstrated that the procedure of Hartley and Runnicles (cf. 1) can be used to determine the amount of "available" quaternary in the presence of organic matter. This had previously (1) been described as impossible. For such a determination it is necessary only to filter the solution containing the quaternary and the organic matter, and to carry out the titration on the filtrate, providing that the organic matter does not itself affect the indicator. Since, in the absence of filtration the procedure gives the "total" quaternary, this new modification allows the estimation of the amount of quaternary which is inactivated by organic matter.

Mack (4) adapted the Hartley-Runnicles procedure to his phytopathological studies. He evaluates the amount of lauryl isoquinolinium bromide deposited on plant leaves by treating the leaves with an excess of sodium lauryl sulfate, and titrating the excess with lauryl isoquinolinium bromide, using bromphenol blue as indicator.

Several modifications of Auerbach's procedure (cf. 1) have been studied. Wilson's procedure (5) is directed particularly to the determination of quaternary compounds in foods, such as fruit juices, bottled sodas, milk, beer, pickles, etc. It does not provide any direct data on the Auerbach method itself. Wilson uses the solubility of the bromphenol blue-quaternary complex in ethylene dichloride and other organic solvents to extract the quaternary from the food and then evaluate the amount colorimetrically. A number of modifications are suggested for specific foods. The data indicate that a recovery of quaternary close to 100 percent can be effected with sodas, mayonaise, etc., at levels of from 1:100,000 to 1:10,000 while with orange juice, milk, etc., the recovery varies from 44 to 92 percent in the same concentration range.

Harris (6) also used the Auerbach method on fruit juices, but extracted the quaternary from the food by a procedure different from Wilson's.

Colichman (7), to obviate the difficulties inherent in the extraction procedure, modified Auerbach's procedure. He proposed the formation of the bromphenol blue-quaternary complex in the presence of an excessive but definite concentration of dye, and measuring the resulting color intensity directly without extraction. This procedure, which the author recognizes to be less sensitive than Auerbach's, is mostly suitable in the range above 100 p.p.m. and the results are claimed to be reproducible to ± two percent. Below 100 p.p.m. the error is much greater.

### *Methods Based On Dyes*

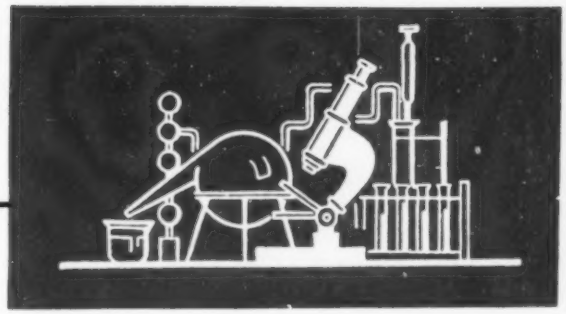
EPTON (8) estimated anionic surface active agents by titrating with a quaternary ammonium compound in acidic solution, using methylene blue as indicator and chloroform as extracting solvent. The end-point is reached when the color in the chloroform and aqueous layers is the same. It is claimed to be reproducible to 0.1 ml. Although this procedure was suggested for anionic substances, there is no apparent reason why it could not be applied to the estimation of quaternaries by titration with anionic agents.

Harper et al. (9) estimated quaternaries in buffered acid solutions by titrating with "Aerosol," an anionic agent with eosin yellow as the indicator and tetrachlorethane as the solvent. This method is claimed to give reproducible results in the range of 20-200 p.p.m. and to be applicable in the presence of milk. This procedure is in appearance very closely related to the "Emulsol" method (cf. 1).

Gobel (10) proposed the use of a mixture of equal amounts of methylene blue and uranine to identify different surface-active agents. Viewed in transmitted light, anionic materials give a yellowish green to dark green color with strong fluorescence; cationic compounds, a vivid blue to bluish red color, without fluorescence.

In connection with the use of dyes, the observation by Sheppard and Geddes (11) that the absorption spectrum of aqueous pinacyanol chloride, a cyanine dye, was shifted from that exhibited in aqueous solutions to that

# A Review, 1946-48



characteristic of its solution in nonpolar solvents by the addition of cetyl pyridinium chloride, is of possible interest. Harkins et al. (12) have explained this phenomenon on the basis that the rapid change in spectrum occurs at the critical concentration for micelle formation; and it should offer possibilities for the estimation of quaternaries.

### *Ferricyanide Method*

WILSON (5) also suggested a procedure using potassium ferrocyanide. It consists in precipitating the quaternary base as a salt of ferricyanic acid, followed by determination of the excess ferricyanide by titration of the iodine which it liberates in an acid solution containing iodides. This procedure has been described in the earlier review (1).

Lettermoser and Steudel (13), long ago, described a similar procedure for alkyl pyridinium salts. It consists in precipitating the pyridinium compounds with excess potassium ferrocyanide in a sulfuric acid solution, and titrating the excess with potassium permanganate, using diphenylamine as indicator. They recommend particularly carrying out the titration electrometrically.

Wilson states that the method is suitable for concentrations above 0.5 percent, and Lettermoser and Steudel did their work at about the same concentrations.

### *Potassium Dichromate Method*

THE use of potassium dichromate again has been suggested (14), this time in a novel fashion involving the solubilization of the dichromate salt of quaternary bases by a nonionic agent, "Triton X-100." This procedure has not been found to allow a sufficient differentiation between, e.g. 1:4000 and 1:6000, although it is claimed to be accurate to within 20 p.p.m. It will not work in the presence of soap as a contaminant.

### *Methods Based On Turbidity*

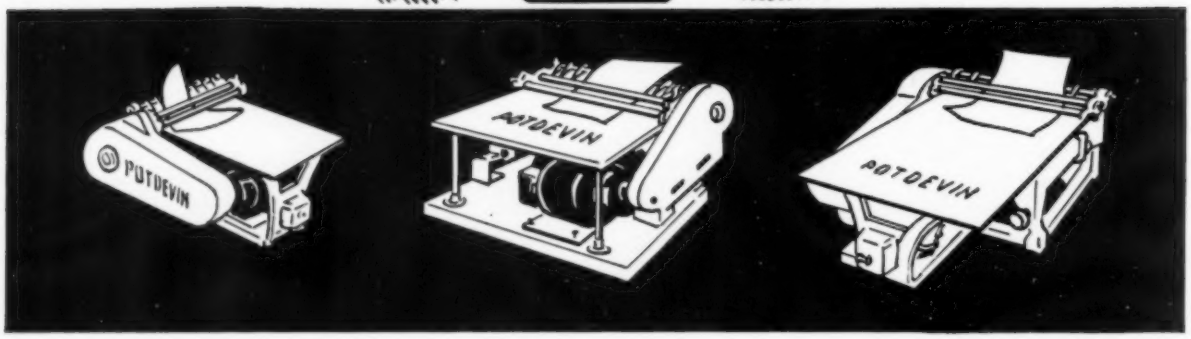
THE estimation of quaternaries by means of turbidity measurement has already been successfully employed, e.g. "Amerse" method (cf. 1). This type of procedure has received a good deal of attention, and it seems that the novel methods proposed offer very promising chances of success, particularly for field testing.

Lambert (15) proposed the estimation of cationics by titration with "Igepon TD," an anionic material, and vice-versa, where the endpoint is determined photometrically as the point where maximum turbidity occurs. It is based upon the formation of a precipitate between high molecular weight cations and anions, and the solubilization of the precipitate by an excess of reagent. The published report does not give any data on concentrations of quaternary compounds below 1:5000, and no information on the accuracy and precision of the method. From a practical standpoint, it suffers from the drawback that only the colloidal, higher molecular weight species in a given commercial product contribute to the formation of the precipitate. In the case of quaternaries composed of mixed species, e.g. alkyl chains of eight to 18 carbons, the method does not detect the total amount of quaternary present, but only a portion.

A somewhat related procedure, although simpler, has been proposed by Goetchius et al. (16). It consists of adding a given number of drops of a one percent "Tamol N" solution (sodium salt of a condensed aryl sulfonic acid) containing 0.1 percent FD & C brilliant blue No. 1 to the solution of quaternary under test. If a precipitate is formed the concentration is at least 1:4000. The number of drops required varies with the quaternary, and some quaternaries, e.g. cetyl pyridinium chloride, do not respond at all. A modification using lower concentrations of reagent is claimed to be sensitive to lower concentrations of quaternary compounds, e.g. 1:10,000. It is to be noted that an excess of reagent dissolves the precipitate formed and in that respect the method resembles the "Amerse" and potassium dichromate methods.

Gain and Lawrence (3) have taken a significant step forward in propounding their procedure for the estimation of quaternary ammonium compounds by turbidity formation in the presence of serum.

It is noteworthy that to the author's knowledge, in all procedures, proposed heretofore, not too much attention has been paid to the well-known interference of organic matter with quaternary ammonium compounds. While laboratory studies on known materials are not so dependent upon this interference, it proves of extreme importance in a field where the organic matter reduces the germicidal activity of the quaternaries, presumably by reducing the amount of available quaternary. Yet, all methods have been found to be unaffected by organic matter and as a matter of fact to allow estimation of the quaternaries in its presence. Hence, the methods may be considered to determine the "total" quaternary present in a solution and not the "available" quater-

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nary. This latter quantity is the one which is of interest in the practice of sanitization and which the health inspector wishes to determine, for it is this quantity which determines the end-results of sanitization.

If the quaternary compounds are considered as salts which dissociate in water to yield a positive and a negative ion, the effect of organic matter can be regarded as a combination of the high-molecular cation of the quaternary with the high-molecular anion of organic matter, such as proteins, cellulose, etc. This effectively neutralizes the quaternary and often leads to its precipitation. However, neutralization is probably due only to salt formation, i.e., it is a rather loose combination. Hence, the addition of a reagent, which is more electronegative than the organic matter, releases the quaternary from its combination with it, and shows its presence. This appears to be true with all reagents suggested up to now, such as, bromphenol blue, "Duponol," etc. Therefore, what is needed to prevent breaking the combination of quaternary with organic matter, is a reagent which is as inert or less inert than organic matter. Apparently, Gain and Lawrence are proceeding in the right direction. Their procedure is simple and should lend itself to use by untrained personnel. It consists of adding one drop of undiluted serum (containing four percent safranine) to one ml. of the dilution of quaternary under test. The appearance of a moderate to heavy turbidity indicates that at least 250 p.p.m. quaternary are present, i.e. that the dilution is 1:4000 or less.

The authors have described the test as merely providing an indication that a given quantity of quaternary is present. They have shown that it is applicable to such commercial quaternaries as "Roccal," "BTC," "Emulsept," "Hyamine," "Onyxide," etc. More important, they have demonstrated that the presence of soaps, synthetic detergents, proteins, etc. reduces the amount of "available" quaternary. Probably the greatest disadvantages of the method are the difficulty to secure the serum and the fact that it is susceptible to bacterial decomposition.

### *Test Papers*

THE desire to provide health inspectors with a simple, rapid method for the evaluation of quaternary compounds has led to the development of test papers. Such papers, however, on the whole, have not been considered satisfactory (16).

Such methods have been proposed by Stone and Marshall, Portley (17) and Harper, et al. (9). Except in this last case, the nature of the reactants used to impregnate the paper has not been revealed. They seem to use principles analogous to those of published procedures such as Hartley-Runnicles, etc., namely the change of color of dyes or dye-combinations in the presence of quaternaries.

No extensive discussion is presented here on the Goetchius, Gain-Lawrence, Portley, etc. procedures, because they, along with the newly introduced "Testabs" procedure are presently under investigation by the Chemical Analysis Committee of the N.A.I.D.M. The results of these cooperative tests will be reported independently.

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For powders containing 90 per cent or more of DDT, highly purified aerosol-grade DDT is micronized. Water-dispersible powders containing about 90 per cent of DDT and sufficient surface-active agent to give a dispersed water suspension of one per cent of DDT, have been prepared by micronizing a mixture of DDT, an anticaking agent, a dispersing agent, and a wetting agent. Water-dispersible powders containing 50 per cent or less of DDT may be prepared from any grade. Since technical DDT is the cheapest grade it is generally used for such powders, but the physical properties of lots obtained from different sources are likely to vary sufficiently to require modification of processing methods. Mixtures containing about 50 per cent of DDT may be micronized to give products of desirable particle sizes. Hammer milling often results in high losses due to packing in the mill, unless an anticaking agent is used and temperature is controlled.

Technical DDT is generally used in preparation of solutions because of its lower price. It often contains insoluble material which may require removal by filtration to prevent clogging of small orifices or to yield a clear solution. Cyclohexanone and isophorone are very useful for dissolving DDT in high concentrations, as much as 100 grams of DDT per 100 grams of solvent at ordinary temperatures. Liquids of lower solvent power which can be used in combination with the former type, include "APS-202," "Aro-Sol," cyclohexene, ethylene dichloride, and others. Stoddard's solvent and kerosene have even lower solvent capacities.

In making emulsions, solvents with high solvent power are combined with emulsifying agents. One formulation that has been used extensively consists of 25 per cent of DDT, 10 of "Triton X-100," and 65 of xylene. This is readily emulsified on pouring into water. R. D. Chisholm, *Chem. Industries* 62, 589-92 (1948).

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## Entomologists to Meet

New insecticides, their toxicity, formulation and mode of action will be discussed at the annual meeting of the American Association of Economic Entomologists, to be held Dec. 13-16, at the Hotel New Yorker, New York. Some sessions of the meeting will be held jointly with those of the Entomological Society of America.


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### EXPERIMENTAL SAMPLES ON REQUEST

# STORAGE OF AEROSOLS

**By J. H. Fales, R. H. Nelson, W. H. Ball, and R. A. Fulton**

United States Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine

LARGE quantities of aerosols containing "Freon-12"* (dichlorodifluoromethane) were produced for military use during World War II, but information was not available on the effect of storing these aerosols for more than a few months. One of the most important characteristics of an insecticide is that it retain its toxicity during storage; therefore, tests have been made annually on stored aerosols from 1945 through 1948 at the Beltsville, Md. laboratory of the Bureau of Entomology and Plant Quarantine. The oldest samples have now been in storage for over five years. It was thought that excessive heating during storage might cause a loss in toxicity of aerosols. Therefore, some tests were made with aerosols that had been exposed to high temperatures. The results of these tests are reported in this paper. The effect of storage on aerosol containers is also discussed.

*Made by Kinetic Chemicals, Inc., Wilmington, Del.

### *Materials and Methods*

IN the storage tests free-flying house flies (*Musca domestica* L.) were exposed to formulas G-215, G-179, and G-199 for 15 minutes in a standard Peet-Grady chamber. The aerosols were delivered directly from the containers or, where possible, were transferred to a laboratory dispenser (Goodhue *et al.* 1945) for more accurate delivery. In every case the aerosol under test was compared with a freshly made sample of the same formula.

The three formulations tested were as follows (figures in per cent):

| | G-179 | G-199 | G-215 |
|---|---|---|---|
| Pyrethrum extract (20% pyrethrins) | 2 | 2 | 2 |
| Sesame oil | — | — | 3 |
| DDT | 3 | 3 | — |
| Cyclohexanone | 5 | — | — |
| Lubricating oil | 5 | — | — |
| Alkylated naphthalene | — | 15 | — |
| "Freon-12" | 85 | 80 | 90 |

For the heating tests, formulas G-179 and G-199 were kept in an oven for 26 days at 60°C. These aerosols were tested against house flies by the swinging-shutter method (McGovran and Fales 1947). Other tests were made with samples of G-215 and G-199 in which the concentrate had been heated for five hours at 85°C. during the paint-baking process at the time the containers were being manufactured. The laboratory dispenser was used for these tests.

**TABLE I**

**Effectiveness against house flies of aerosol formulas G-215 and G-179 after 2 years in storage**

| Formula No. | Average age | Tests | Average dosage per 1,000 cubic feet | Average knockdown in — | | | Average kill in 1 day |
|---|---|---|---|---|---|---|---|
| | | | | 5 minutes | 10 minutes | 15 minutes | |
| | Months | Number | Grams | Per cent | Per cent | Per cent | Per cent |
| G-215 | 29 | 28[1] | 4.99 | 46 | 64 | 75 | 57 |
| | Freshly made | 8 | 4.88 | 47 | 67 | 77 | 55 |
| G-179 | 27 | 10[2] | 3.02 | 52 | 69 | 78 | 95 |
| | Freshly made | 4 | 3.01 | 18 | 36 | 68 | 91 |

[1] 9 samples. [2] 4 samples.

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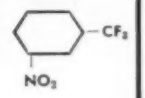
**(m—nitrotrifluoromethylbenzene)**
$NO_2C_6H_4CF_3$




**TYPICAL PHYSICAL DATA**

| | |
|---|---|
| Molecular Weight | 191.11 |
| Freezing Point | −5.0° C |
| Boiling Point | 203.° C |
| Distillation Range (ASTM) | 200.5 to 208.5° C |
| Refractive Index, n20/D | 1.472 |
| Specific Gravity, 15.5°/15.5° C | 1.437 |

Another new fluorine containing product, Hooker m—nitrobenzotrifluoride, is of particular interest as an intermediate in the preparation of dyestuffs and other fluorine containing compounds.

m—Nitrobenzotrifluoride is a thin, pale straw oily liquid with an aromatic odor. The $CF_3$ group is stable to further chemical reaction. The nitro group may be reduced. The product is subject to further nuclear substitution in the meta position. It is at present available in pilot plant quantities. Technical Data Sheet No. 365 describes m—nitrobenzotrifluoride more fully and is available when requested on company letterhead.

## SODIUM SULFIDE ($Na_2S$)

**DESCRIPTION:**
Light yellow colored solid in flake form. Rapidly soluble in water; slightly soluble in alcohol; insoluble in ether.

**PHYSICAL DATA:**

| | |
|---|---|
| Mol. Wt. | 78.1 |
| M. P. | 100° C |

ANALYSIS

| | |
|---|---|
| $Na_2S$ | 60 to 62% |
| NaCl | 1.5% Max. |
| Other Na Salts | 2.0% Max. |
| Fe | 8 ppm Max. |
| Cu, Ni, Cr, Mn, Pb | 1 ppm Max. |
| Water of crystallization | 36.5 to 34.5% |

**USES:**
In manufacture of dyestuffs, chemical intermediates, paper pulp, special glass, soap and rubber; as an ingredient of dye liquor for textile dyeing; in calico printing, boiling out linen; desulfurizing viscose rayon; ore flotation and metal refining; in unhairing hides and wool pulling.

**SHIPPING CONTAINERS:**
Steel drums ..... 90 and 350 lbs. net

## SODIUM SULFHYDRATE (NaSH)

**(sodium hydrosulfide)**

**DESCRIPTION:**
Light lemon colored solid in flake form. Completely and rapidly soluble in water, alcohol and ether.

**PHYSICAL DATA:**

| | |
|---|---|
| Mol. Wt. | 56.1 |
| M. P. | 55° C |

ANALYSIS

| | |
|---|---|
| NaSH | 70 to 72% |
| $Na_2S$ | 0.25 to 2.5% |
| NaCl | 0.4 to 0.8% |
| $Na_2SO_3$ and $NaHCO_3$ | 0.04 to 0.4% |
| Fe | 5 ppm Max. |
| Cu, Ni, Cr, Mn, Pb | 1 ppm Max. |
| Water of Crystallization | 28 to 26% |

**USES:**
As a chemical intermediate in preparation of dyestuffs and other organic chemicals such as thioamides, thiourea, thioglycolic acid, thio-and dithiobenzoic acids, sodium thiosulfate. In unhairing hides, in desulfurizing viscose rayon.

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### *Effect of Storage on Toxicity*

TABLE 1 gives the results of tests with samples of formulas G-215 and G-179 that had been stored by the United States Army in various locations, including overseas storage, for two years. At the same dosage the knockdown and kill of house flies were about equal for the stored and the freshly made formulations.

In tests with a sample of G-215 that was evaluated after three, four and again after five years of storage, the knockdown and kill were no different from those of freshly made materials. The results of these tests are shown in table 2. The differences in the levels of mortalities between the three years were due to the variation in the resistance of the flies and not to any loss in toxicity by the stored sample, as the freshly made formula gave similar results in each case.

### *Effect of Heat on Toxicity*

FORMULA G-179 remained effective after it had been in an oven for 26 days at 60°C., but the sample of formula G-199 deteriorated slightly.

At an average dosage of 0.39 gram per 1,000 cubic feet, the average kill after one day was 48 per cent with formula G-179 as compared with 34 per cent for the unheated check. At the same dosage the heated sample of formula G-199 gave an average kill after one day of 46 per cent as compared with 55 per cent for the freshly prepared sample.

There was little difference in knockdown or kill of house flies when samples of G-215 and G-199 that had been heated for five hours at 85°C. while the paint was being baked onto the containers were compared with unheated samples. At an average dosage of 9.26 grams per 1,000 cubic feet, the average knockdown in 15 minutes was 83 per cent with formula G-215, as compared with 90 per cent with the unheated check. The average kill after one day for the two samples was 70 and 67 per cent, respectively. At an average dosage of 1.4 grams per 1,000 cubic feet the knockdown was 41 per cent for formula G-199 and 47 per cent for the unheated check. The average kill in one day was 80 and 76 per cent, respectively.

### *Effect of Storage on Containers*

CLOSELY associated with the possible break-down of an aerosol formula under storage with subsequent loss in toxicity is the effect on the container itself on the chemical reactions taking place inside. Five steel aerosol containers up to three years of age, each containing a different "Freon-12" formulation, were emptied and sawed open. The formulations used and the observations made are shown in table 3.

### *Summary of Results*

"FREON-12" aerosols containing pyrethrum and sesame oil remained toxic after having been stored for as long as five years, and pyrethrum-DDT aerosols up to 2½ years.

Little or no loss in toxicity resulted from heating aerosols in an oven at 60°C. for 26 days, and at 85° for five hours while the paint was being baked onto the container.

A few metal containers were severely corroded by formulas containing DDT, whereas there was no corrosion in others. Heat treatment of containers prior to filling was found to accelerate corrosion. There was no corrosion by the pyrethrum-sesame oil formula after three years of storage.

### *Literature Cited*


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McGovran, E. R., and J. H. Fales. 1947. Swinging-shutter apparatus for measuring small dosages of insecticidal aerosol. U. S. Bur. Ent. and Plant Quar. ET-239, 7 pp. [Processed.]


**TABLE II**

**Effectiveness against house flies of aerosol formula G-215 after 3, 4, and 5 years of storage. Dosage 4.65 grams per 1,000 cu. ft.**

| Storage age | Average knockdown in — 5 minutes | 10 minutes | 15 minutes | Average kill in 1 day |
|---|---|---|---|---|
| Years | Per cent | Per cent | Per cent | Per cent |
| 3 | 79 | 90 | 96 | 92 |
| Freshly made | 81 | 84 | 95 | 93 |
| 4 | 48 | 68 | 73 | 66 |
| Freshly made | 47 | 68 | 72 | 66 |
| 5 | 62 | 81 | 89 | 72 |
| Freshly made | 65 | 80 | 86 | 68 |

**TABLE III**

**Effect of different aerosol formulations on interior of steel containers stored up to 3 years.**

| Aerosol formulation | | Length of storage period | Effect |
|---|---|---|---|
| | Per cent | Months | |
| DDT | 5 | 36 | Severe corrosion. |
| Cyclohexanone | 10 | | |
| "Freon-12" | 85 | | |
| Pyrethrum extract (20%) | 1 | 22 | Oil ring present, with a black residue below the solution level. |
| DDT | 1 | | |
| Lubricating oil | 9 | | |
| "Freon-12" | 89 | | |
| Pyrethrum extract (20%) | 2 | 36 | A few DDT crystals on side of container. No corrosion detected. |
| DDT | 3 | | |
| Cyclohexanone | 5 | | |
| Lubricating oil | 5 | | |
| "Freon-12" | 85 | | |
| Pyrethrum extract (20%) | 2 | 15 | DDT crystals and heavy oil rings present. Corrosion beneath oil rings. |
| DDT | 3 | | |
| Lubricating oil | 5 | | |
| Propylene oxide | 5 | | |
| "Freon-12" | 85 | | |
| Pyrethrum extract (20%) | 2 | 36 | Hard wax from pyrethrum extract at top of solution level. No corrosion. Odor of rancid sesame oil. |
| Sesame oil | 8 | | |
| "Freon-12" | 90 | | |


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# ROACH CONTROL

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Sanitary Engineering Department
The Johns Hopkins University

IN the United States, cockroaches are the most detested insect of food-handling establishments. These insects allegedly have followed the shipping routes from the tropical regions, to spread throughout the temperate zone, finding suitable environment in hotels, restaurants, bars, meat markets, bakeries, in pantries and kitchens of private homes and aboard ship. The problem is so universal that on practically every Food Establishment Inspection Record there appear two items: "Absence of insects and vermin," and "absence of poisonous chemicals." These apply primarily to roaches and roach control and of course, to a lesser degree, to house flies, weevils, silver polishing compounds and etc. Whether it is admitted or not, most establishments have roach populations and no better evidence of the fact is reflected than in the tremendous annual expenditure by these food plant operators to the pest control industry.

In spite of these efforts health department inspectors are continually finding roach infestations, which quite often brings forth the inquiry from the exasperated owner "Well, what do YOU suggest for roach control"? More often than not, (and I draw on personal experience) the food sanitarian is embarrassed by this question. He will most likely answer with such favored statements as "scrupulous cleanliness" and "suitable insecticide" but actually he does not have the solution in such simple terms. The sanitarian is embarrassed because his recommendations normally do not work well and subsequently the confidence of the operator of the establishment is lost. As is the case with some food sanitation measures, the public health reason for roach control is based on circumstantial rather than good epidemiological evidence. Investigators have shown that the roach could potentially convey typhoid and other infectious diseases by mechanically contaminating food.

In situations of reasonably good sanitation, it is difficult to establish the association between the roach and infectious materials. Roaches do enter and return from sink and floor drains in search of food and water, but our observations show that only the nymphs of the German roach are able to escape from well designed and maintained commodes and urinals. In our modern food handling establishments, with good plumbing installations and maintenance, we are forced to consider the roach largely an "esthetic" rather than a "sanitary" menace. Neverless, the loss of confidence in the health department's ability to supply the solution to the roach problem adds to the difficulty of influencing other, perhaps more significant, health measures.

### *Alteration of Environment*

MOST professional pest control operators are aware of the fact that certain environmental alterations will have an effect in limiting the total roach population in a food handling establishment. In actual practice, however, these environmental control measures are seldom utilized. This may be due to the lack of cooperation on the part of the owner who is interested in purchasing only the dramatic, quick-acting, removal of the nuisance. As a result most pest control operators employ some blatticide which requires repetitive treatment to maintain a suitably low infestation.

Without delving into the detailed ecology of the common species of roaches it will be advantageous to summarize some of the more important limiting factors of infestation. In food handling establishments, the three species of cockroaches most likely to be encountered are, *Blattella germanica,* the German roach, *Periplaneta americana,* the American roach, and *Blatta orientalis* the Oriental roach. Gould and Deay (1) have studied the biology of these species and from their observations certain theoretical comparisons of reproductive potential may be made. For example, assuming a 50 percent sex ratio and no mortality through intra and inter specific competition, a single gravid female of each species would have an average number of living descendants after a period of one year as tabulated below:

| *Species* | *Annual Descendants for one Gravid Female* |
|---|---|
| *Blattella germanica* | 400,000 |
| *Periplaneta americana* | 800 |
| *Blatta orientalis* | 200 |

It is not hard to visualize that of the three species, the German roach

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presents the most difficult control problem. The lack of natural predators would substantiate the concept that a given habitat would soon establish a saturated population level and that permanent reduction of the species could not be accomplished through the insecticidal approach alone. By virtue of their larger size which limits their harborage facilities, slower growth rates and greater susceptibility to certain insecticides, the control of the American and Oriental roach is readily accomplished.

THE required habitat of the German roach is easily satisfied in most food handling establishments. The "mother foci" of the colonies are usually associated with the warmth (70°F.), moisture and protection afforded by water pipes and equipment requiring plumbing. The German roach is so small that it can conceal itself in narrow cracks and crevices around base-boards, pipes, conduits, sinks, drawers; behind storage cabinets, inside switch boxes, refrigerators, under surfaces of tables, chairs, shelves, and between stacks of stored goods, in fact almost every place which normally does not receive the scrutiny of the human eye. Food supply is no major problem for the roach. Even though the kitchen appears spotless and all food is apparently protected, the roach is able to find nourishment. There is the forgotten morsel kicked under the cabinet too low for inspection or adequate cleaning, or the accumulation of food lodged in cracks and indentations of pots and pans, or the meat block, or on the edge of the baker's bench jammed tightly against the wall, and even the wet mop containing thousands of titbits, is in its proper place awaiting the horde.

Food sanitarians have given much thought to practical measures of attaining insect control through environmental rather than chemical measures. The elimination of needless dampness such as caused by leaking water or drain pipes, excessive condensation under flooring, in walls and along pipes will do much in limiting the total roach population. In our modern building construction the moisture problem should be studied.

Rowley (2) has listed four causes which have brought the condensation problem into the foreground during the past few years. They are: 1. addition of artificial humidity (which is quite high in kitchens), 2. weather stripping and better building construction with subsequent reduction of air infiltration, 3. better building papers offer greater resistance to the passage of vapor through the outer wall surface and, 4, the addition of insulation has reduced the temperatures of outer parts giving colder surfaces for the condensation of vapor. Studies indicate that 80 percent of the vapor may be prevented from travelling into the wall if the interior surface is finished with a good vapor barrier. Glazed tile gives reasonably good protection as well as many oil paints and both present the smooth, washable surfaces demanded in food handling establishments. A judicious use of ventilation in attics and ceilings will do much in preventing condensation troubles.

F. A. Korff (3), Director of the Bureau of Food Control of the Baltimore City Health Department has ably diagnosed the cause for poor environmental sanitation in food plants. Many of his suggested remedies will do much in the prevention of large roach infestations and embody simple and practical steps aimed at limiting food, water and harborage. The equipment and its location within the plant offers the most promising point of improvement. The equipment used in food handling establishments shows considerable lack of forethought in sanitary design and construction. This holds true for all sizes and kinds of equipment from the dish washer to the can opener. The poor location of the equipment within the establishment is responsible for much of the unclean conditions and provides excellent harboring places for roaches. Heavy equipment that cannot be moved is most frequently installed against the wall. Sinks, dish washers, and other equipment requiring plumbing are similarly located and add to the complexity of cleaning by a maze of close fitting pipes and numerous openings into the wall or floor.

Based on actual observations, Korff's suggestion regarding the problem of equipment and its location are quite effective. He states, "Equipment should be purchased under specifications that include the phrase 'must be of all-metal construction (if practical) and readily demountable and easily cleaned.' " Further, "Equipment should be located or relocated approximately 18 inches from walls and 10 inches from floor." For psychological reasons it appears advisable to paint the floor white in this 18 inch zone from the walls. Right angle corners, cracks and crevices should be eliminated through the liberal use of coving and caulking compounds. The dry, truly clean establishment cannot support a large roach infestation.



### *Insecticidal Measures*

WHILE the use of blatticidal chemicals will not permanently eliminate the problem of roaches in food handling establishments, considerable assistance may be attained through this approach. Literature is abundantly available on the effectiveness of the newer synthetic insecticides on the common household roach. Stenburg (4) has shown in quite a number of field studies the effectiveness of various techniques of applying DDT. The most effective technique appeared to be the combination of liquid spray followed by dust. In general the American roach was controlled with lighter dosages of DDT

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than the German roach. The numbers of roaches were rapidly reduced in one week and remained low for the 16 weeks of observation. Several newer compounds are claimed to have greater blatticidal properties than DDT. Outstanding among them is chlordane ($C_{10}H_6Cl_8$), (5 and 6) and a chlorinated camphene know as "Toxaphene" * $C_{10}H_{10}Cl_8$), (7). On the basis of weight the gamma isomer of benzene hexachloride (BHC) has generally been a much more effective insecticide than DDT. This material displays in addition to stomach and contact poisoning action, a strong fumigating property against the German roach (8). It has been reported to be superior to DDT in the control of roaches when applied in dust containing 10 percent gamma isomer (9).

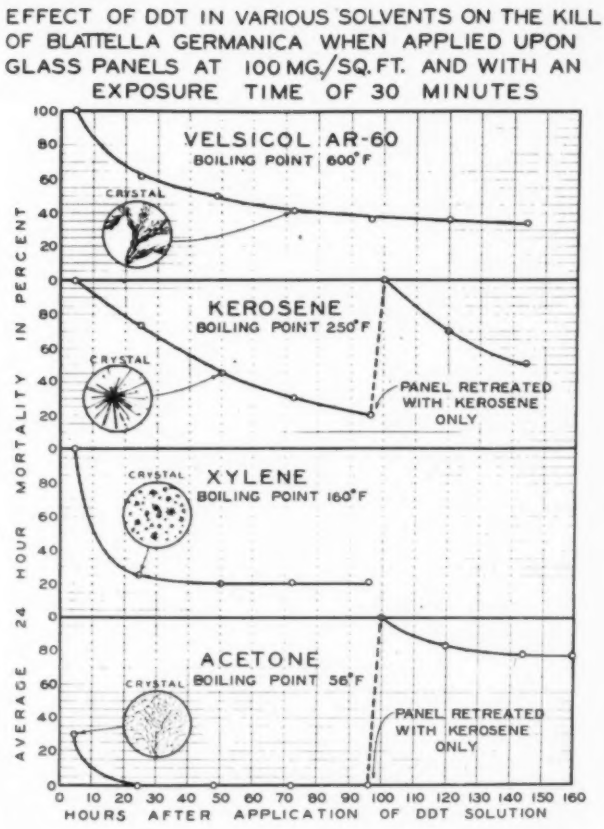
From the literature it is somewhat difficult to compare the relative merits of these materials due to differences in method of application, dosage, and contact time employed. In an effort to clarify this situation studies were conducted to determine which material and in what form would be most useful in controlling *Blattella germanica*.

Early work consisted of exposing three replicates of 30 adult insectary-reared *Blattella germanica* to glass panels treated with 100 mg. DDT (Tech.) per square foot in various solvents. After a 30 minute contact period the insecticide panel was removed from the roach proof test box and mortality recorded at the end of 24 hours. The boxes were lined with paper which was discarded after each test run. Controls were placed in the test box under petri dish tops and also observed for 24 hours. The insects when handled were first anaesthetized with carbon dioxide gas and no difficulty with contamination or handling was experienced throughout the experiments as evidenced by very good survival in the controls.

The summary of these observations is shown in Figure 1. The most striking observation was that 24 hours after application the 100 mg. DDT per sq. ft. would require much longer contact time than 30 minutes for satisfactory kill. These data show that the mortality with a given contact period may be expected to vary with the volatility of the solvent used and that, when crystalized, DDT apparently was not as effectively transported to the vital portions of the roach. This was further confirmed by the observation that the crystalized DDT could be reactivated by merely applying one ml. per square ft. of kerosene. The characteristic crystal pattern obtained with each of these solvents is sketched to scale; the diameter of the circles shown on Figure 1 is approximately one mm. Apparently the uniformity of distribution or sharpness of the crystal is not as effective as the heavily clumped formation. Of the four solvents used, only the poly-methyl naphthalene ("Velsicol AR-60") displayed toxicity giving an average kill of 47 percent with a 30 minute contact period four hours after applying the solvent. None of the solvents used were toxic to the roaches 24 hours after application.

Our efforts to determine the effects of various diluents on the DDT applied as a dust were quite discouraging, but showed the superiority of DDT in this form over the conventional sprays. The diluents tried were lime, talc, silica and activated carbon. Here the greatest difficulty was in obtaining contact periods less than one minute over which 100 percent mortality in 24 hours was always obtained. For reducing the exposure period to a matter of seconds, an experimental gas chamber room designed for physiological hygiene experiments was utilized. The room had a comparatively low ceiling, air tight doors and was completely lined with sheet metal which facilitated the counting of insects. Concentric circles from one to five feet in diameter were laid out on the floor and by releasing adult German roaches one at a time in the center of the ring, the average running rate of 0.6 feet per second was determined. Thus, if an average contact time of one second were desired, a circular band of insecticide 0.6 foot wide was applied. An average of 150

FIG. 1

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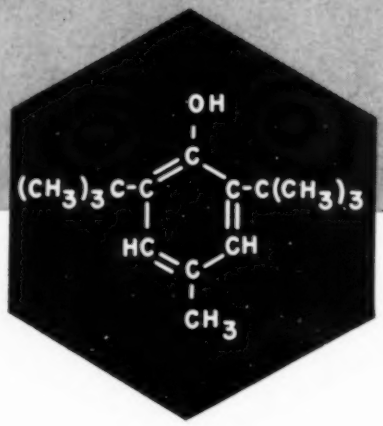


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roaches were released in the center of the test ring and 24 hour mortality observed. No significant differences in mortality could be found between various DDT diluents, so it was concluded that any highly micronized diluent would be satisfactory for applying DDT dust. Using the above mentioned techniques, the contact time and insecticide concentration were altered and the effect on roach mortality observed. Encouraged by results with DDT, efforts were directed to determine the average time of contact giving a satisfactory 24 hour kill with different insecticides at varying rates of application. It is apparent that while this information is highly desirable, it is extremely difficult to obtain with any degree of accuracy. Some 250 separate tests employing an estimated 15,000 adult German roaches were carried out in order to obtain adequate information. All available blatticides could not be so evaluated and the six formulations selected were as follows:

*Dust formulations*:

DDT Technical without diluent
50% Chlorinated camphene in talc
50% Benzene hexachloride dust

*Solution formulations*:

5% DDT in Kerosene
5% Chlordane in Deobase
22% Benzene hexachloride in cyclohexane

Dosages were computed in milligrams of technical insecticide per square foot of surface. In view of its unusual toxic properties the technical benzene hexachloride was considered to contain 50 percent active isomers of which six percent was the gamma isomer.

The procedure consisted of determining the per cent kill obtained with increasing contact periods on surfaces treated at 50, 100, 500 and 1000 mg. per sq. ft. of technical insecticide; (10 mg. per sq. ft. was employed only in the BHC dust). These results were plotted, time against kill, on log probability paper and a line of best fit drawn for each concentration. The time and concentration giving 90 percent mortality was determined by extrapolation and then rechecked by additional experiments until a reasonable accuracy was obtained. Since all of the

**TABLE 1**

**Significance Test of Time and Concentration Versus 24 hour Kill of Blattella Germanica**

**BENZENE HEXACHLORIDE DUST**

| Contact Time Sec. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 10 | 50 | 100 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 10 | 50 | 100 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 10.6 | 2.3 | 3.0 | 15.9 | |
| 1 | 30 | 5 | 26 | 27 | 58 | (1.1) | (1.9) | (0.1) | | .0005 |
| | | | | | | 8.0 | 1.9 | 1.9 | 11.8 | |
| 10 | 30 | 9 | 29 | 29 | 67 | (0.1) | (0.0) | (0.0) | | .002 |
| | | | | | | 7.7 | 0.5 | 0.5 | 8.7 | |
| 30 | 30 | 10 | 30 | 30 | 70 | (0.5) | (1.0) | (0.1) | | .011 |
| Total | 90 | 24 | 85 | 86 | $X^2$ | (1.7) | (2.9) | (0.2) | | |
| | | | | | P | .367 | .223 | 0.6 | | |

**CHLORINATED CAMPHENE**

| Contact Time Sec. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 100 | 500 | 1000 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 100 | 500 | 1000 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 6.1 | 0.8 | 2.5 | 9.3 | |
| 1 | 30 | 9 | 26 | 27 | 62 | (7.1) | (0.4) | (0.1) | | 0.0 |
| | | | | | | 0.0 | 0.0 | 0.3 | 0.4 | |
| 10 | 30 | 26 | 29 | 29 | 84 | (1.0) | (0.0) | (0.0) | | 0.6 |
| | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| 30 | 30 | 29 | 30 | 30 | 89 | (2.7) | (2.5) | (0.0) | | 0.6 |
| Total | 90 | 64 | 85 | 86 | $X^2$ | (10.8) | (2.9) | (0.7) | | |
| | | | | | P | .004 | .223 | 0.6 | | |

**DDT DUST**

| Contact Time Sec. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 100 | 500 | 1000 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 100 | 500 | 1000 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 13.2 | 1.5 | 5.8 | 20.6 | |
| 1 | 30 | 2 | 22 | 27 | 51 | (10.6) | (0.5) | (0.0) | | 0.0 |
| | | | | | | 3.8 | 1.5 | 0.6 | 5.9 | |
| 10 | 30 | 13 | 30 | 27 | 70 | (0.1) | (0.2) | (0.0) | | 0.0 |
| | | | | | | 0.1 | 0.0 | 0.0 | 0.1 | |
| 30 | 30 | 28 | 30 | 30 | 88 | (12.9) | (0.2) | (0.1) | | 0.6 |
| Total | 90 | 43 | 82 | 84 | $X^2$ | (23.7) | (1.0) | (0.2) | | |
| | | | | | P | .0003 | .606 | 0.6 | | |

**TABLE 2**

**Significance Test of Time and Concentration Versus 24 hour Kill of Blattella Germanica**

**DDT IN KEROSENE**

| Contact Time Min. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 100 | 500 | 1000 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 100 | 500 | 1000 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5.7 | 3.8 | 18.5 | 28.0 | |
| 1 | 30 | 0 | 1 | 16 | 17 | (4.0) | (10.4) | (3.4) | | .0001 |
| | | | | | | 7.7 | 3.8 | 22.1 | 33.6 | |
| 30 | 30 | 3 | 6 | 30 | 39 | (0.2) | (3.2) | (0.1) | | .0001 |
| | | | | | | 8.2 | 2.3 | 2.3 | 12.8 | |
| 60 | 30 | 9 | 30 | 30 | 68 | (6.2) | (25.5) | (0.1) | | .0015 |
| Total | 90 | 12 | 37 | 76 | $X^2$ | (10.4) | (39.1) | (3.6) | | |
| | | | | | P | .006 | .0001 | .175 | | |

**CHLORDANE IN DEOBASE**

| Contact Time Min. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 100 | 500 | 1000 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 100 | 500 | 1000 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2.5 | 0.4 | 5.1 | 8.0 | |
| 1 | 30 | 1 | 3 | 9 | 13 | (15.3) | (15.1) | (8.5) | | .018 |
| | | | | | | 1.0 | 0.3 | 0.6 | 1.9 | |
| 30 | 30 | 21 | 29 | 30 | 80 | (0.8) | (3.3) | (2.1) | | .399 |
| | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| 60 | 30 | 30 | 30 | 30 | 90 | (0.4) | (4.2) | (2.1) | | 1.000 |
| Total | 90 | 52 | 62 | 69 | $X^2$ | (16.5) | (22.6) | (12.7) | | |
| | | | | | P | .0002 | .00001 | .0019 | | |

**50% BHC IN CYCLOHEXANE**

| Contact Time Min. | No. Per Trial | Av. No. Dead/Trial Dose—mg./sq. ft. 50 | 100 | 500 | Total Dead | Obs.—Exp.)²/Exp. Dose—mg./sq. ft. 50 | 100 | 500 | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5.4 | 0.6 | 9.6 | 15.6 | |
| 1 | 30 | 6 | 12 | 27 | 45 | (6.2) | (5.0) | (0.1) | | .0004 |
| | | | | | | 3.2 | 0.2 | 1.7 | 5.1 | |
| 30 | 30 | 15 | 26 | 30 | 71 | (0.6) | (0.5) | (0.0) | | .082 |
| | | | | | | 0.1 | 0.0 | 0.0 | 0.1 | |
| 60 | 30 | 27 | 30 | 30 | 87 | (7.6) | (2.3) | (0.0) | | .6 |
| Total | 90 | 48 | 68 | 87 | $X^2$ | (14.4) | (7.8) | (0.1) | | |
| | | | | | P | .0006 | .018 | .6 | | |


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solutions give excellent kill when wet, the sprayed glass panels were allowed to dry 24 hours before exposing the roaches. It is of importance to test whether there are any significant differences in the variations of kill obtained with different times of contact that may be due to other than chance sampling. The significance of any differences in kill with various dosages at a constant contact time was also determined. Space will not permit the complete tabulation but a summary of some of the basic data is shown in Table 1 for dust formulations and in Table 2 for solutions.

By studying Table 1 it may be seen that with benzene hexachloride dust there are no real differences in the mortality of roaches for contact periods from one to 30 seconds. The differences obtained would have occurred by chance alone four, two, and six times out of 10 repeated tests for the 10, 50 and 100 mg. per sq. ft. dose. The differences in kill with varying doses of dust was much more significant especially between the 10 and 100 mg. per sq. ft. dose.

With DDT and the chlorinated camphene dust it may be observed that differences in kill were real in the 100 mg. per sq. ft. concentration with varying time below 30 seconds. This was not the case for the higher concentrations. The difference in kill with varying concentrations was not significantly affected, excepting at the contact period of one second. The insecticidal solutions as shown in Table 2 gave, on the whole, more real differences than the dusts. This is undoubtedly due to the much wider spread of contact time employed.

Figure 2 shows the average time required with a given dose of insecticide producing a satisfactory kill of *Blattella germanica* in 24 hours. The data we obtained have been plotted in Figure 2, acknowledging that some of the differences shown are not too significant. The data show that benzene hexachloride would be the most effective blatticide, however its characteristic musty odor would tend to limit its use in some establishments. There appears to be little gained in applying 50 percent BHC dust in excess of 100 mg. per sq. ft. and chlorinated camphene or DDT in excess of 200 mg. per sq. ft. The application of 50 percent BHC solution in excess of 100 mg. per sq. ft. would gain little in efficiency and would result in more musty odor than desired in eating establishments. Chlordane should be applied at about 500 mg. per sq. ft. and for DDT a higher concentration is desirable to give any appreciable results. It is apparent that after the solvent evaporates the dust formulations are much superior to most of the solutions. The apparent greater effectiveness of chlordane over DDT may be due to the persistent sticky nature of the material, coupled with a slight fumigating property.

### *Field Demonstration*

SEVERAL homes, kitchens and animal rooms infested with the German roach have been dusted with 50 percent BHC dust and evaluation made in terms of visual inspections. In all cases good results were reported. It was felt, however, that a more accurate estimate of the roach populations should be made for evaluating the effect of control measures. A small experimental animal room having an exceedingly heavy German roach infestation was selected for study. Glass jar traps baited with dog chow soaked in beer yielded excellent catches. The initial population by trapping was sufficiently large, therefore the "Lincoln Index" method of estimating numbers by marking and recapturing specimens was undertaken. Three greased jar traps were distributed throughout the room. The days catch was anesthetized with $CO_2$, counted, dusted with fluorescein and released in the room before applying the insecticide. Some 630 roaches were marked in this manner. A 50 percent BHC dust was applied as a barrier deposit under cages, around walls and in drawers at a rate of 100 mg. per sq. ft. Two days after applying the insecticide, all dead roaches were recovered and inspected in water droplets for marking. A

(*Turn to Page* 169)

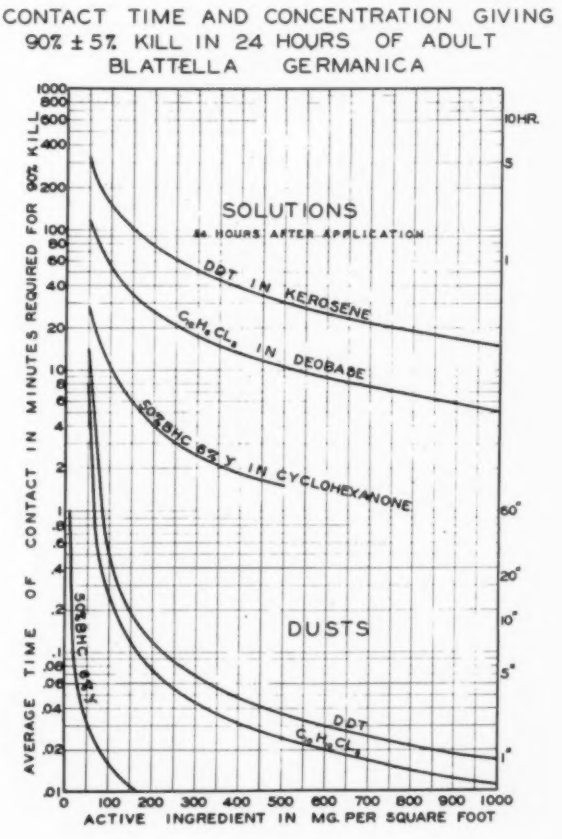


FIG. 2

or scrubbing with water and soap is generally sufficient for cleaning unfinished wood floors which are cleaned regularly. Occasionally, scouring with an abrasive such as powdered pumice or with steel wool is also desirable. For cleaning and scrubbing oily and greasy floors a solution of trisodium phosphate, sodium metasilicate, washing soda, or a synthetic combined with or without quantities of a soap, TSP, or other alkalies can be used. The synthetics are especially desirable for cleaning in the hard water areas. When synthetics are not used, sufficient amounts of a polyphosphate (e.g. sodium hexametaphosphate ("Calgon"), sodium tetraphosphate ("Quadrafos"), tetra sodium pyrophosphate, etc.) will be required. For unfinished wood floors, which are badly stained, one of the various proprietary products containing oxalic acid or sodium hypochlorite can be used effectively in solution with water. Rinsing must be thorough, but the surface must be scrubbed dry.

5. *Varnished, Shellacked, Oiled, Painted and Waxed Floors.* Unless excessively dirty, these types of finished wood floors should be merely dusted clean with a soft brush or dry mop and then—with the exception of waxed floors—polished with an oiled mop or cloth. If washing is absolutely necessary, a solution of slightly soapy warm water may be used for cleaning the surface which is then rinsed with a rag moistened in clear water, wiped dry, and finally polished with an oiled mop. Frequent washings of waxed floors with synthetic detergents, soap, etc. will tend to emulsify the waxes and rewaxing is then necessary.

6. *Cement Floors.* Unpainted cement floors can be scrubbed clean by the use of hot water and a synthetic detergent; hot water and one of the alkaline salts, (washing soda, modified soda ash, TSP, TSPP, sodium metasilicate) together with a scouring powder; or hot water and a scouring powder. In appreciably hard water areas, the use of synthetic detergents in conjunction with alkaline salts is especially effective. However, polyphosphates can be added to the alkaline solutions to soften the water. Soap, uncombined with a synthetic or with a water softener (one of the polyphosphates) should not be used.

After scrubbing, thorough rinsing is essential to prevent the loosened soil as well as the tacky residues of soap from clinging to the surface.

Painted cement floors are to be washed or mopped with mild synthetic detergent solutions.

Excessively gritty, or greasy cement or concrete surfaces such as driveways, garage floors, engine room floors, may be scrubbed with a hot solution of sodium metasilicate, trisodium phosphate, or with a mixture of trisodium phosphate and soda ash. An abrasive powder may also be added to the solutions. In adition to these methods, heavy greased cement floors can be effectively cleaned by the use of certain proprietary oil and grease absorbent materials.

Stained concrete may be cleaned by covering the stained area with a mixture of whiting (which is an abrasive) and a hot solution of trisodium phosphate. When the mixture has dried and hardened, it is then scraped off and the surface is rinsed again with hot clean water.

Heavily soiled surfaces can be treated with a layer of dry hydrated lime or fine, dry coal ashes, after the concrete surface has been scrubbed and washed in the regular way.

7. *Tile and Terrazzo Floors.* For regular scheduled washing, a small amount of an alkaline detergent (washing soda, TSP, sodium metasilicate) in hot water, can be used effectively. Excessively dirtied areas can be scoured with an abrasive powder either alone or added to the alkaline solution. The abrasive can be of a rougher type than that used on marble floors. In hard water areas, synthetics are desirable or the addition of a polyphosphate to the alkaline solution. The use of soaps should be generally avoided in hard water areas. Again, of of importance is the rinsing operation. Such floorings must be thoroughly rinsed with plain water and immediately wiped dry, thus avoiding a possible loosening of the cement to which the tiles are glued.

8. *Marble Floors.* Mildly alkaline solutions are effective for use on marble floors, provided the rinsing process is thorough, otherwise the alkaline salts, which are not completely removed from the marble surface during the washing process, may work into the pores, crystallize and cause disintegration of the marble. For rather dirtied marble—where soil clings tenaciously—a very fine abrasive can be employed satisfactorily. Rough abrasives or other scouring materials will scratch the marble finish, especially that of polished marble. Built soaps may also be used. Plain soap cannot be used with good results in hard water areas. Acids are to be avoided entirely; for even weak acids, as oxalic, will in time dissolve marble.

9. *Linoleum.* Warm solutions of mild alkaline detergents, mild or neutral soaps, or synthetic detergents are acceptable for use on linoleum. In hard water areas, synthetics or an addition of a polyphosphate to the alkaline or soap solutions is essential. Abrasives or strong alkaline solutions should not be used. In addition, too much water is not desirable, for the cement may loosen and the backing of the linoleum may rot. Therefore, rinse water must be wiped thoroughly dry. Waxed linoleum need be washed only a few times a year. Frequent washings with detergent solutions will emulsify the wax to such an extent that rewaxing will be required.

10. *Rubber Floors.* Cleaning preparations containing coarse abrasives or strong alkalies are not to be used. Soap is also to be avoided, since it will tend to soften the rubber flooring. The same is true of hot water and the use of excessive amounts of water. Solutions of modified soda, trisodium phosphate, or tetra-sodium pyrophosphate can be used effectively. In hard water regions the synthetic detergent is of considerable advantage; otherwise a water softener must be used in conjunction with the alkaline solution. Rinsing requires the use of plain, cold water.

Stained rubber flooring can be effectively cleansed by means of a very

fine abrasive. Badly stained areas can be treated with gasoline, carbon tetrachloride or acetone. Yet these materials must be used with extreme caution, so as to avoid possible softening of the rubber. Morever, gasoline and acetone are both flammable solvents.

11. *Cork Floors.* Natural cork floors are mopped clean with lukewarm water and a mild or neutral soap. In hard water areas, synthetics or softeners added to the soap solution will be desirable. Strong alkalies are to be avoided. Waxed cork surfaces are generally rubbed with gasoline and then scrubbed with a solution of warm water and soap. Thorough rinsing is obtained by using plain water which is to be frequently changed. Stained cork surfaces can be cleaned with the aid of very fine emery paper or fine steel wool. Occasionally, a cloth dampened in carbon tetrachloride or acetone may be used effectively.

12. *Asphalt Tile Floors.* These flooring materials are of soft composition. As a consequence, any cleaning preparation containing abrasives, slightly alkaline materials or organic solvents such as gasoline, turpentine, etc., should not be used on these surfaces—whether waxed or unwaxed. The use of plain soap is likewise undesirable, since soap will tend to fill the soft porous composition with a layer of soap, which will be extremely difficult to remove by rinsing. The best detergents for use on such surfaces are the synthetics or built soaps. For the best results, these are to be used in lukewarm water. Because of the soft composition of asphalt tile floors, the surface must be thoroughly dried after rinsing.

13. *Windows.* Solutions of ammonia and water, or small quantities of synthetic detergent or one of the alkalies such as tetrasodium pyrophosphate are most suitable.

## NEW TRADE MARKS

(*From Page 65*)

**FORMULA 12**—This in upper case, extra bold letters and numerals for rug, fabric and automobile cleaning preparation. Filed Dec. 26, 1947 by Cudahy Packing Corp., Chicago. Claims use since Sept. 5, 1947.

**TABLE III**

| Line of Flies | Percentages of puparia that failed to emerge | | |
|---|---|---|---|
| | Generations 1-5 | Generations 6-10 | Generations 1-10 |
| Check | 14.26 | 9.46 | 10.66 |
| Treated with DDT | 16.75 | 15.05 | 15.69 |
| Treated with Pyrethrum | 17.11 | 12.84 | 13.60 |
| Treated with extractives of a botanical | 23.06 | 17.16 | 18.84 |

## INSECT RESISTANCE

(*From Page 121*)

treated with pyrethrum and extractives of a botanical, the figures were 2.9 per cent and 8.2 per cent respectively.

***Discussion***

All of the data, with the single exception noted, agree in showing that the treated flies and their progeny were affected by the treatments with insecticides, and that the treated lines appeared to have become somewhat resistant to each of the insecticides studied.

The slight, but constant, differences between the weights of puparia in lines treated with insecticides and the checks may have resulted because the insecticides killed the weakest, which may also have been the smallest flies. This is further suggested because the puparia of the treated lines seemed to be more uniform in size than is usually true in untreated lines. The differences in the rates of emergence of flies from puparia may indicate that small amounts of the active principles of the insecticides were transmitted from the treated flies through the eggs and larvae to the puparia.

***Summary***

FOUR lines of the house fly were established from one jar culture of the current laboratory line. In 10 successive generations all individuals of one line were treated with DDT, all of a second line were treated with pyrethrum, all of a third line were treated with extractives of a botanical, and individuals of the fourth line served as a check, the breeders being untreated in each generation.

The insecticides were applied to the thorax of flies immobilized with carbon dioxide at dosages found previously to cause mortality of 50 per cent. Applications were made by use of a micro-injection apparatus calibrated to deliver 0.002 ml. per drop. The use of the measured drop technique assured that each fly received an identical dosage and none escaped treatment.

Flies were treated in 10 successive generations. A comparison of the rates of mortality of flies of the treated lines with that of flies of the check line which received the same treatment showed that fewer flies of the treated lines died in most generations than was the case with the treated checks or, that they had acquired resistance to each of the insecticides.

Puparia of the treated lines were somewhat larger, on an average, than were those of the checks.

In the cultures the flies of which were treated with DDT, the average rate of non-emergence was 5.0 per cent greater than it was from puparia of the untreated checks, and for cultures the flies of which were treated with pyrethrum and extractives of a botanical these figures were 2.9 and 8.2 per cent respectively.

All of the data with a single exception agreed in showing that the treated flies and their progeny were affected by the treatments with insecticides, and that the treated lines appeared to have become somewhat resistant to each of the insecticides studied.

## LAUNDRY BLEACH

(*From Page 140*)

volume strength. A solution for stock use is made by taking six quarts of 100-volume hydrogen peroxide and diluting it with 30 gallons of water to give a five-volume solution. The recommended addition to a 100-pound load of white work is one quart of this stock solution. When a 10-volume stock solution is used, the addition to the washer is at the rate of one pint per 100-pound load. (16) Wool and

silk articles can be bleached by using a one-volume strength of the peroxide. This solution is made by adding one pint of 10-volume hydrogen peroxide to 1¼ gallons of water. (13)

A small amount of acid is retained in or added to hydrogen peroxide solution during the manufacture to help maintain stability. The bleaching action of hydrogen peroxide is very slow when the solution has an acid reaction. For this reason peroxide bleaching baths are usually made alkaline with small quantities of ammonia, sodium silicate or other alkali. (8)

For domestic laundering, the housewife is advised (21) to dilute the 10-volume (three per cent) type of hydrogen peroxide in a ratio of 20 to one with lukewarm soapy or clear lukewarm water and then to add one tablespoonful of household ammonia. A soaking bath is considered best; the articles to be bleached being immersed for 30 minutes or more until the desired effect is obtained. Variations of the home bleaching procedure are given by other authorities. (32)

Straight hydrogen peroxide solution may be supplied to the laundry but improved and modified solutions are also made available by supply manufacturers. For example, one leading producer of bleaches makes a solution containing a minimum amount of inhibitor and a specially selected wetting agent which is added to facilitate a quick penetration and uniform bleaching action. As might well be expected, modern products of this kind are protected by patents. (33)

As with hypochlorite solutions, it is possible for the laundryman to make his own hydrogen peroxide solutions from sodium peroxide. However, this material is a very powerful oxidizing agent and may constitute a fire hazard; its employment requiring great care. As a matter of fact experts (8) do not recommend its use in laundries.

### Sodium Perborate's Use

SODIUM perborate is another substance which is used as an oxidizing bleach. In his earlier review, Johnson (16) mentions briefly that sodium perborate is sometimes used for bleaching special articles or for stain removal purposes. Providing more detail, Harvey (13) notes that sodium perborate has no precipitating action on soap and can be added to the washing machine during the washing, preferably in the form of a solution previously prepared in tepid water. He cites observations which indicate that sodium perborate is the most efficient agent for the removal of perspiration stains. Although it can be used for bleaching practically all textile fabrics, it is especially useful in the bleaching of woolen and silk goods, where the use of a chlorine bleach is out of the question. Worth stressing, however, is Jackman's (8) statement regarding the widespread but erroneous belief that sodium perborate is a harmless bleaching agent. He emphasizes that unless it is used under strictly controlled conditions, the compound can cause severe damage to fabric.

At this time, it may be mentioned that sodium perborate is sometimes an ingredient of some washing powders or soap powders, thus providing a product affording both bleaching and detergent action. (34) For example, a rather simple preparation of this sort may consist of: (35)

| | |
|---|---|
| Soap powder | 90 parts |
| Sodium perborate | 10 " |

More elaborate preparations have been described in patent specifications, (36) as in the following formula for making bleaching and washing powder:

| | |
|---|---|
| Sodium perborate | 15 parts |
| Sodium hexametaphosphate | 10 " |
| Soda ash | 9 " |
| Magnesium silicate | 1 " |
| Soap | 49 " |

It is quite obvious that for some producers or distributors of sanitary products the inclusion of laundry bleaches in their line represents no great difficulties. This is especially true of those already making hypochlorite solution for general sanitation use by industry, in public places and in the home.

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# TECHNICAL BRIEFS

*From Current Literature in the Sanitary Products Field*

## Pyrethrin Synergist

Piperonyl butoxide is useful in combination with pyrethrum and forms highly stable mixtures with pyrethrins. It is a nearly odorless, clear, neutral, pale yellow, oily liquid with a slightly bitter taste. It is soluble in mineral oils and evaporates without leaving a residue. It can be used in emulsions, dusts, and in wettable powders for sprays and dips.

When used alone, piperonyl butoxide is mildly toxic to houseflies, but when eight parts are mixed with one part of pyrethrins, a household fly spray is obtained which exceeds by 70 per cent the Official Test Insecticide containing pyrethrins, in knockdown and kill. Household surface sprays containing 100 mg. of butoxide and five mg. of pyrethrins in odorless petroleum oil gave 131 days of residual action on houseflies.

Household dusts containing one per cent of butoxide and 0.16 per cent of pyrethrins gave satisfactory control of cockroaches.

On domestic animals, butoxide-pyrethrin combinations in emulsions or light oil sprays repelled horn flies for four hours, and by direct application killed horn flies and mosquitoes. At the doses applied as insecticides, butoxide is safe to use on warm-blooded animals. W. E. Dove, *Am. J. Trop. Med.* 27 339-45.

## Chlorinated Insecticides

Including DDT, there are now six chlorinated compounds generally available as insecticides. The others are dichloro-diphenyl-dichloroethane, methoxychlor, benzene hexachloride, chlordane, and chlorinated camphene. All of these are absorbed to some extent from the gastro-intestinal tract of animals. The first four are known to be excreted in the urine in a changed form. Since analytical methods for determining chlordane and chlorinated camphene in biological tissues are not yet available, very little is known regarding their metabolism or fate in the animal body. G. Woodard, B. Davidow, and A. J. Lehman, *Ind. Eng. Chem.* 40, 711-12 (1948).

## DDT of Selective Nature

DDT was prepared by coating the individual particles with degraded cellulose and allowing this coating to harden. This prevented the usual effect of DDT as a contact poison and limited it to the poisoning of insects by ingestion. Such a modification makes the DDT selective for certain insects. This may prove useful in killing some insects without killing other types which are the natural enemies of the first. W. E. Ripper, R. M. Greenslade, J. Heath, and K. Barker, *Nature* 161, 484 (1948).

## Killing Mosquito Larvae

A field study in a vegetation-packed canal was made to determine the characteristics of the most effective form of DDT spray for use against mosquito larvae. DDT dosages of 4-80 grams per acre, delivered in solutions or emulsions of 0.55 per cent, and drop sizes of 0.4-1 mm. diameter, were investigated. By spraying dyed solutions, the relation between sprayed dosage and delivered dosage was determined. About 30 per cent of the smaller drops was lost in the wind, but no appreciable loss of coarser spray occurred. For five per cent DDT-oil solutions, variation of drop size between 0.4 and one mm. did not affect kill except at dosages less than 10 grams per acre, where wind loss produced variable results.

DDT should be distributed in high dilution; 4.3 per cent of DDT-oil solution applied at 10 grams of DDT per acre gave little higher kill than 0.43 per cent. Oil solutions proved better than emulsions. A delivered dosage of 40 grams of DDT per acre as small drops is the apparent optimum for economical DDT use. The first two larval stages of the mosquitoes are more susceptible to DDT than later larval stages and pupae. Residual toxic effects of DDT-oil films do not extend beyond three days. C. G. Johnson and W. H. Walton, *Bull. Entomol. Research* 38 405-30.

## Study of Insecticides

A qualitative examination of the properties of insecticides showed that the "sandwich" method for determining the toxicity of stomach poisons indicates values for lethal dosages exceeding the true value by amounts which depend on the speed of action of the poison and the appetite of the larvae. A modification of the "film" method involves drying the impregnated filter paper before exposure to insects. With DDT, subsequent oiling of the filter paper did not affect the action of the insecticide on woodlice. In compounds analogous to DDT which contain para-substituents other than chlorine, polar groups are associated with lower toxicity than non-polar. In compounds containing other halogens, toxicity is greatest for fluorine and least for bromine and iodine analogs. Certain *ortho*-and *para*-substituted benzonitriles gave promising results as contact poisons and fumigants but not as stomach poisons. H. Martin and R. L. Wain, Ann. Rept. Agr. and Hort. Research Sta., Long Ashton, 1944, 121-40.

## Book on Waxes

"The Chemistry and Technology of Waxes" by Albin H. Warth, chemical director of Crown Cork and Seal Co., Baltimore, published recently by Reinhold Publishing Corp., New York, (519 + VIII pages; $10), is another contribution to recent efforts to collect the rather widely scattered literature on the subject of waxes. The present volume is designed as a ready reference work for chemists and industrialists dealing with waxes. There are nine chapters dealing with the physical and chemical aspects of waxes, of which one is a brief historical introduction to the subject, and another on uses of wax in industry. Here we find a five and one-half page

section "wax in polishes" that is of interest and importance to manufacturers in the sanitary chemicals field. There is also an eight page discussion of "Waxes for Floors and Floor Coverings" and another section on "Wax in Shoe Creams" in the chapter on the use of wax in industry.

Other chapters deal with "The Natural Waxes," Chemical Components of Waxes" and "Methods for Determining the Constants of Waxes." The appendix includes tables of physical constants of waxes.

With "Adventures in Man's First Plastic" by Nelson S. Knaggs of Hilton-Davis Chemical Co. Division, Sterling Drug Co., Cincinnati, (also published by Reinhold—$6.75), which is a more popular treatment of the subject of waxes, "The Chemistry and Technology of Waxes" would seem to be a natural and necessary companion.

## Stabilizing Insecticides

Derris and pyrethrum insecticides can be stabilized against the action of light by coating with a reducing agent or antioxidant. Among those suitable are aromatic amines, polyhydroxy phenol, sulfites, and a coloring matter which absorbs the high-frequency light, such as chloramine yellow G. Preferably a film-forming substance is also present such as gelatin. The coating composition is dissolved or suspended in water. M. de Domenico and G. B. R. de Domenico, French Patent No. 861,309.

## Larvicides

There is no correlation of larvicidal action with the absolute value of surface tension. Mixtures of the larvicides do not behave quantitatively like the sum of the components. N. V. Ermakov, Med. Parasitol. Parasitic Diseases (U.S.S.R.) 16, No. 4, 59-74; through *Chem. Abs.*

## Standard DDT Films

Dry films of crystalline insecticides, after sorting the crystals to the desired size range, can be prepared by mixing the crystals with soluble starch and placing on glass plates which have been treated with a thin film of Mayer's albumin. R. L. Patton and D. S. Sarkaria, *Science* 107, 654 (1948).

## Testing Fungicides

A modified Rideal - Walker phenol coefficient method was used with *Trichophyton gypseum* spore suspensions to determine the fungicidal activity of water-insoluble compounds. The conidia of *T. gypseum* are resistant to 25 per cent alcohol, 50 percent acetone, 80 per cent propylene glycol, and 95 per cent triethanolamine when exposed to these solutions for 15 minutes. The fungicidal activity of water-insoluble substances dissolved in the solvents named may be compared with that of water-soluble substances provided the compounds are not in saturated solution. There was no correlation between fungicidal and fungistatic activity of the compounds tested. For example, brilliant green was fungicidal at one in 100 and fungistatic at one in 100,000, while 2-chloro-4-phenyl phenol was fungicidal at one in 400 and fungistatic at one in 10,000. The cylinder-plate method used by Florey for determination of penicillin was adapted to the determination of fungistatic activity. A. B. Hillegas and E. Camp, *J. Investigative Dermatol.* 6, 217-26.

## Phosphate Determination

A method for determination of phosphorus in hexaethyl tetraphosphate and tetraethyl pyrophosphate is rapid and reliable. It involves conversion of the organic phosphorus by alkali-nitrate fusion and dilute nitric-acid digestion, followed by a colorimetric determination by the yellow molybdivanado-phosphoric acid method. M. Jacobson and S. A. Hall, *Anal. Chem.* 20, 736-7 (1948).

## New Rodenticides

The rodenticides that have been most widely used have been phosphorus, strychnine, thallium sulfate, white arsenic, zinc phosphide, and red squill. All of these but the last are also powerful poisons to other animals and must be very carefully used. It has long been known that phenyl thiourea tastes bitter to some people and has no taste for others, and that this is an inherited characteristic. Rats eat it readily and a small amount causes death in 48 hours. This discovery resulted in investigation of a large number of related compounds from which was chosen *alpha*-naphthyl thiourea. The disadvantage of this is that rats not killed by the first dose build up a tolerance, so that repeated baitings are of little additional value. Sodium fluoracetate is a highly effective rodenticide but it is highly toxic to all animals so that its use should be limited to skilled operators. A new rodenticide now being tested in this country is 2-chloro-4-methyl-6-dimethyl-amino-pyrimidine, developed during the war. R. H. Wellman, *Chem. Ind.*, 63, 223-9 (1948).

## Fungicidal Fumigants

Mixtures of paraformaldehyde and 2,4,6-trichloraniline are effective in killing fungi exposed to their vapors. The preferred concentration is 75-90 per cent of paraformaldehyde, and the preferred gas concentration is 50-85 per cent of formaldehyde. Ten species of fungi inoculated in six inch Petri dishes were killed during five days' exposure to 0.1-gram pellets of the mixture. The products are specially useful for control of fungi in closed spaces.

Mixtures containing paraformaldehyde and dihydronaphthalenes, specifically the 1,2-and 1,4-isomers, similarly. W. S. Hinegardner et al, to E. I. du Pont de Nemours & Co. U.S. Patent Nos. 2,425,677 and 2,425,678.

## Insecticidal Lime Wash

Lime washes containing 160 mg. DDT per square foot gave high mosquito mortality after a two-hour exposure; eight mg. per square foot of the active principle of "Gammexane" gave high kills in one hour. Both insecticides remained effective six to eight weeks under temperature conditions. J. Hadjinikolau and J. R. Busvine, *Bull. Entomol. Research* 39, 179-83 (1948).

## Butene Derivative

The preparation of 3,4-bis (dibutyl amino)-1-butene is described. The compound is useful in insecticidal sprays for combating flies, mosquitoes, and other insect pests. G. H. Morey, to Commercial Solvents Corp. U. S. Patent No. 2,441,669.

# TRADE NEWS

## Varley Names Coast Reps.

James Varley & Sons, Inc. of St. Louis, have recently announced the appointment of E. P. Gilsdorf & Co., as their West Coast representative to cover California, Washington, Oregon, Montana and Idaho. E. P. Gilsdorf, H. B. Barger and F. J. Koch, who will sell the Varley line of industrial disinfectants, insecticides and cleaners to wholesale and distributing outlets only, have had a number of years experience in the sanitation and distributing fields in the western area. It is expected that stocks of the Varley line will be carried in several West Coast cities some time early in 1949.

## McCormick Adds to Board

Edward J. Vinnicombe, Jr., manager of the bulk and institutional division of McCormick & Co., Baltimore, was recently elected to the firm's board of directors. He has been with McCormick since the end of World War II, during which he served as a lieutenant colonel as Aide de Camp, Headquarters Commandant and Provost Marshall in both the First and Third Service Commands. Previous to his war service, he was manager of the Hotel Puritan, Boston.

## Ill. PCO's Form Assn.

Organization of the Illinois Pest Control Association was completed at a meeting on Oct. 29 in Chicago, to which pest control operators throughout the state had been invited. Committees, working through the past summer, drafted a constitution which was submitted for ratification at the meeting. Officers were elected and a service program worked out, according to Stanley Lind, head of American Laboratories, Chicago, spokesmen for the operators who are promoting the new organization.

## Honor DDT Discoverer

The discoverer of DDT as an insecticide, Dr. Paul Mueller of Geigy Drug Industries, Basle, Switzerland, parent organization of Geigy Co., New York, received the 1948 Nobel Prize in medicine for his work on DDT. The prize is worth about $44,000 and will

DR. PAUL MUELLER

be presented to Dr. Mueller on Dec. 10, in Stockholm, Sweden. Dr. Mueller, now 48 years old, entered the Geigy Laboratory at 25 as assistant manager in charge of work on synthetic tanning substances. DDT (dichloro-diphenyl-trichloroethane) was actually produced first in 1874 by a German student, but was not put into practical use until 1947 when Dr. Mueller and his staff at Geigy discovered its insecticidal properties.

## Reese Joins Fergusson

Robert M. Reese, for a number of years connected with Winthrop-Stearns, Inc., New York, and one of the pioneers in the development of the quaternary ammonium compound type germicides, recently joined Alex. C. Fergusson Co., Philadelphia, as director of the sanitation division.

## Powell BHC Booklet

A new technical bulletin on benzene hexachloride that is based on recent experimental and actual field usage of BHC, was issued recently by John Powell & Co., New York. Copies are available on request. The new bulletin stresses the main uses of the chemical that has been effective in controlling livestock insects, mites, lice, ticks, grasshoppers, etc. Incorporating most of the basic data found in a previous Powell bulletin on BHC, the new nine-page brochure is designed to clarify the use of this insecticide in the pest control field. Chemical and physical data, toxicity, method of action, effectiveness against various insects and related information are presented. Full labeling instructions and directions for use are also included.

## NSSA New York Meeting

The third eastern regional meeting of the National Sanitary Supply Association will be held at the Park Central Hotel, New York, Thurs. and Fri., Dec. 9 and 10.

The meeting will follow the outlines of last year's convention, with registration from 10:30 a.m. until 2:00 p.m. of the first day. A discussion session begins immediately following the conclusion of registration. Although program details are still tentative, it is expected that there will be two talks, one on sales, the other on advertising, as well as a panel discussion on the subject of floor treatment. Participants in the forum will be a wax manufacturer, a producer of floor sealer, and a supply firm.

On the first afternoon a cocktail party is planned for 6:00 p.m. to precede the annual dinner and entertainment, of which Jess Keppler of Keppler Bros., New York, is in charge. A morning session and luncheon, Friday, Dec. 9, will conclude the meeting.

On the program committee, are Lee Fried of Enterprise Paper Co., New York, with Jack Kahn of Windsor Wax Co., Hoboken, N. J., as co-chairmen, who plan to have a discussion of quaternary ammonium type disinfectants at the Friday morning session. Registration fee, which includes the cost of the annual dinner and cocktail party, will be $15, again this year. General chairman for the affair is Jack Gantz of Empire Brush Works, Port Chester, New York, eastern regional vice-president of the National Sanitary Supply Association.

## Koppers Advance Thiessen

Dr. Gilbert Thiessen, formerly development manager of the Chemical

Division, Koppers Co., Pittsburgh, Pa., has been named technical advisor for the division.

### Acquires, Renames Firm

Floor Store Janitor Supply Co., Anderson, Ind., was recently acquired by C. E. Crosby, who has changed the name of the firm to Midwest Janitor Supply Co., and relocated it at 629 Main St., Anderson.

### Hospital Germicide Report

A report on "Germicides, Antiseptics and Disinfectants for Hospital Use" by Dewey H. Palmer, research director, was issued recently by the Hospital Bureau of Standards and Supplies, New York. The report, latest in a series issued by the Bureau, is in the form of a 16-page booklet and sells for $1.00 Discussed in the report are terminology and definitions of such terms as "germicide, bactericide antiseptic and disinfectant'; chemical disinfection; and specific agents: alcohols, chlorine compounds, iodine, formaldehyde solutions, quaternary ammonium salts, "G-11," mercurials and the phenols. Applications and limitations of specific compounds are also covered. The booklet, which may be obtained by writing the Bureau at 247 Park Ave., New York 17, also has a rather lengthy bibliography.

### Penick Aerosol Fog Folder

"Effective Insect Control in Aerosol Fogs" is the title of a recently issued folder of S. B. Penick & Co., New York. The feature of the folder is a chart showing recommendations for general insect control work using Penick insecticides in the "Tifa" type fog dispensers made by Todd Shipyards, Inc., New York. A partial list of insecticides and rodenticides made by Penick is carried in the folder.

### Ultra Private Label Waxes

Ultra Chemical Works, Inc., Paterson, N.J., announced recently that it is making available to distributors in the industrial maintenance field for private brand label use three of its floor waxes. Catalogs describing the physical and chemical properties of these waxes, as well as methods of evaluating them, are available.

### Services Cite Annand

Dr. P. N. Annand, chief of the Bureau of Entomology and Plant

DR. P. N. ANNAND

Quarantine, U.S.D.A., was recently given a citation signed by Army and Navy Secretaries Robert P. Patterson and James Forrestal for new methods of insect control developed during the war under Dr. Annand. The citation reads: "The War Department and the Navy Department express to Percy N. Annand their appreciation for an outstanding contribution to the work of the Office of Scientific Research and Development during World War II." Developments mentioned include aerosol bombs, DDT formulations and clothing impregnated for protection against insects.

### Wood on Sales Training

Sales training and selection of sales personnel at G. H. Wood & Co., Toronto, are described in an interview with Geoffrey H. Wood, president, and published in a recent issue of *Marketing*, Canadian Weekly for advertisers and sales executives. In the article, Mr. Wood describes in considerable detail the workings of his company's 10 week program of sales training. The initial step of choosing a salesman has been made more accurate through the use of aptitude tests, according to Mr. Wood, who pointed out that before the use of aptitude tests, turn-over among salesmen ran from 25 to 30 percent With the expected increase in competitive selling within the next few years, the need for more and better sales training will grow. To meet this need, Mr. Wood, whose company has 29 branches and 135 salesmen throughout Canada for the sale of its 176 products, has designed a seven-point sales training program.

### Sprayer Has $CO_2$ Unit

A new type compression sprayer that eliminates hand pumping by the incorporation of a carbon dioxide gas cylinder mounted on the outside of a three gallon galvanized tank was announced recently by R. E. Chapin Manufacturing Works, Inc., Batavia, N. Y. The new feature permits the tank to be filled to capacity, heretofore impossible because of the need to leave space to accomodate the air compressed by hand. The carbon dioxide tube contains 10 ounces of liquefied carbon dioxide gas, enough to spray 15 gallons or five complete tankfuls of spraying liquid. The carbon dioxode gas is released by turning a valve that leads into the airtight tank. The tank can also be filled with compressed air by hand when the carbon dioxide cylinder is emptied. Cylinder is easily detachable and can be returned to the dealer or factory for 24 hour refill service. Approximate retail price of the complete unit is $20.00.

### New Fuld Price List

Fuld Brothers, Inc., Baltimore, recently issued a 72-page descriptive price list and catalog of their line of sanitary chemicals and related items. In addition to a detailed, alphabetical listing of products, there is a five page index of products made and handled by the company.

### Chemco Relocates

Chemco Products Co. recently announced the relocation of its general offices and plant at 7740 W. 47th St., Lyons, Ill.

### Ohio Pesticide Meeting

The annual meeting of the Ohio Pesticide Institute will be held December 1 and 2 at the Fort Hayes Hotel, Columbus, O. The program consists of half day panel discussions of fungicides, insecticides, herbicides, and rodenticides. The meeting is an open one.

## S.O.C.M.A. Hears Talk on Sales Training

DR. W. S. Calcott of E. I. du Pont de Nemours & Co., Wilmington, Del., was the guest speaker at the Nov. 10, monthly luncheon of the Synthetic Organic Chemical Manufacturers Assn. of the United States, held at the Hotel Commodore, New York. Dr. Calcott spoke on the subject of "The Chemical Industry in Germany." Also on hand for comment was Dr. Emil Ott of Hercules Powder Co., Wilmington, who recently returned from a trip to Europe.

The need to train salesmen was discussed by Oliver Benz of the development department of E. I. du Pont de Nemours & Co., Wilmington, in a talk before the Oct. 13 luncheon of the S.O.C.M.A. Mr. Benz mentioned four reasons why such a need existed. The reasons included disruption of sales activites due to the war, a situation which continues to exist today; disruption of organizations and personnel changes, which calls for fundamental selling: new product ingredients, new processing methods and new products; and the necessity for lower distribution costs through improved sales effiicency. Since not more than 25 percent of the salesman's day is spent in productive selling, this time must be utilized to its greatest possible advantage, Mr. Benz declared. He pointed out that the average man selling today has had no experience in "competitive" selling, such as was done in pre-war years. Because many of a company's prospects have had changes in the personnel of their organization, salesmen calling on them must be able to present a fundamental sales story about their products. Because of the technological and product changes that have taken place in recent years, salesmen should have the new information about the products and industries they are selling. Too much is taken for granted about what a salesmen knows, it was discovered in recent company surveys, Mr. Benz stated. Salesmen should be thoroughly familiar with the details of the product they are selling, those made by their competitor, and, above all, they must know the applications of their company's products. Mr. Benz then went on to outline four types of training meetings, which he said had proved their value. Meetings should be constructive and enthusiastically run and their negative aspects should be overcome. Constant vigilance of salesmen is needed, Mr. Benz pointed out.

### Magnus Aids Red Cross

Percy C. Magnus, president of Magnus, Mabee & Reynard, Inc., New York, has accepted the chairmanship of a New York Sponsors Committee for the Red Cross 1949 fund. He will be responsible for the formation of a committee to stimulate early support of the 1949 appeal in Manhattan and the Bronx.

### CSA Xmas Party Dec. 15

The annual Christmas party of the Salesmen's Association of the American Chemical Industry will be held at the Hotel Astor, New York, Wednesday evening, Dec. 15.

At the group's annual business meeting, held at the Hotel Roosevelt, Oct. 27, the following members were elected to the nominating committee: James J. McInnes, Jr., Commercial Solvents Corp., New York, chairman; Edward J. Maguire, Grasselli Chemical Div., E. I. du Pont de Nemours & Co., New York; Stephen F. Urban, E. R. Squibb & Sons, Brooklyn; Jerome M. McGinty, Millmaster Chemical Co., New York; Philip J. LoBue, Frank Fanning and John A. Chew, all of companies bearing their names, New York.

A half-hour show preceded the meeting.

### Fritzsche Branch Changes

A number of changes in personnel of its branches was announced last month by Fritzsche Brothers, Inc., New York. In Chicago, Joseph A. Gauer, manager of the Fritzsche branch there has been retired because of ill health. He is succeeded by M. J. Niles, formerly in charge of the New England branch with offices in Boston. Mr. Niles' successor is Harry P. Bowra, who covered western Canada for Fritzsche Brothers of Canada, Ltd. Gerald D'Amico will assist Mr. Bowra, whose duties in Canada will be handled by Ian MacInnes, a member of the firm's sales staff for over 10 years. Lloyd W. Speck, manager of the Toronto branch will have the additional assistance of Jacques Champagne in serving the Province of Quebec.

A further change concerns John T. Brickner, who has been appointed manager of the Fritzsche San Francisco branch, replacing T. N. Davis who has resigned to go into business for himself.

**Scene in Chicago's Municipal Stadium recently where "Velsicol 1069" chlordane, made by Velsicol Corp., Chicago, was used to spray the stadium in preparation for the eleven-day country fair held there. The stadium was sprayed by Chicago Exterminating Co., using a new Hudson mobile sprayer.**

## N. P. C. A. Meets, Elects Montgomery

NEW chemical insecticides, their effectiveness, toxicological problems connected with their use, and the outlook as useful tools of the pest control operator, were the subjects which formed the basis for most of the papers and discussions before the 16th annual meeting of the National Pest Control Association, held October 18-20 at the Royal York Hotel, Toronto. Over 500 members and guests from the U. S. and Canada attended the three-day meeting which closed with the annual banquet at which William S. Bomby was toastmaster and Hon. Russell T. Kelley was the main speaker.

V. H. Montgomery of the Montgomery Pest Control Co., San Francisco, was elected president for 1948-49 succeeding George L. Hockenyos. Regional vice-presidents for the ensuing year were chosen at the meeting as follows: I. B. Carncross, Syracuse Chemical Co., Syracuse, N. Y.; Harold E. Jennings, Smithereen Co., Chicago; William Q. Phippard, Wilmar Co., Cincinnati; Robert B. Mesecer, Bob's Termite Service, Burbank, Calif.; C. A. Trimbos, Protex Service, Dallas, Tex.; Herman L. Fellton, Orkin Exterminating Co., Atlanta, Ga. Robert C. Yeager of Rose Exterminating Co., Cincinnati, was reelected secretary-treasurer, and William O. Buettner of the Buettner Pest Control Co., Brooklyn, was again chosen executive secretary.

Among the leading speakers at the meeting were Dr. F. C. Bishopp, Dr. James C. Munch, Dr. Bruce H. Douglas, Prof. J. J. Davis of Purdue University, Dr. L. S. Henderson, and NPCA v.p., Herman Fellton. Panel discussions were led by Arthur Ochs, T. F. Winburn, and C. Norman Dold.

V. H. MONTGOMERY

### Control Officals Meet

The second annual meeting of the Association of Economic Poisons Control Officials was held at the Shoreham Hotel, Washington, D. C., Oct. 9. Caution in marketing of new insecticides and closer cooperation among government officials and manufacturers were the dominant themes of the meeting. Dr. H. W. Hamilton, representing the National Association of Insecticide and Disinfectant Manufacturers; James McConnon, vice-president of McConnon & Co., Winona, Minn.; G. F. McLeod, president of the Pacific Insecticide Institute, Fresno, Calif; Justus C. Warr, chief of the Pharmacology and Rodenticide Section of the Production and Marketing Administration, U. S. Dept. of Agriculture, Washington, D. C., and S. A. Rohwer, assistant chief, Bureau of Entomology and Plant Quarantine, U.S.D.A., Washington, D. C., spoke at the meeting on various problems relating to insecticides.

New officers elected at the meeting include: Dr. Henry J. Hoffman of St. Paul, Minn., president, to succeed Dr. J. L. St. John, Pullman, Wash.; Dr. J. F. Fudge, College Station, Tex., vice-president, who fills the vacancy left by Dr. Hoffmann's advancement. Dr. A. B. Heagy, College Park, Md., continues as secretary-treasurer.

**Left: The new "Microsol #202" insecticidal fog dispenser made by Hession Microsol Corp. of Darien, Connecticut. Machine is first portable fog-making unit unit and is said to be the first piece of equipment capable of producting an insecticide fog without use of heat, gas, steam, smoke, etc. The dispenser weighs 11½ pounds and is powered by a full ⅓ H.P. 110-120 Volt A. C.-D. C. Universal motor. Mitchell-White Corp., New York is national distributor of the machine.**

### Hyman Cuts Chlordane

A reduction in the price of chlordane manufactured by Julius Hyman & Co., Denver, was announced recently. Price cuts affect agricultural and refined grades of Hyman's "Octa-Klor" brand.

### J. L. Brenn Recovered

J. L. Brenn, president of the Huntington Laboratories, Inc., Huntington, Ind., and former president of NAIDM, returned to his office Nov. 8 following an absence of several weeks during which he underwent an operation at St. Joseph's Hospital, Fort Wayne, Ind. He reports his present condition as excellent and fully recovered from the operation.

### Purdue Conference Dates

The Purdue Conference of the National Pest Control Association will be held Feb. 7-11, 1949, inclusive, it was announced recently. Because of another conference which is taking place at the same time, early reservations are urged.

# Classified Advertising

Brings excellent results at a minimum cost. Rates are only 10c per word with a minimum charge of $2 per issue (position wanted advertisements accepted at half rates). Whether you have some surplus equipment or material for sale, have a position open or are looking for a new connection, etc., use space in the Classified Section of *Soap and Sanitary Chemicals.*

# N. A. I. D. M. Meets in New York Dec. 6, 7

A BALANCED program that will divide its emphasis about equally between insecticides and disinfectants, with time allotted for waxes, various committee reports and topics of general interest to business, will be offered to those attending the 35th annual meeting of the National Association of Insecticide & Disinfectant Manufacturers, to be held Monday and Tuesday, Dec. 6 and 7, at the Hotel New Yorker, New York. This year the group returns to its customary meeting city following last year's session in Baltimore, and reverts also to a 2-day program in contrast with the 3-day program at Baltimore and at Spring Lake in June.

Insecticides of both the low pressure aerosol and spray types will be covered in discussions touching on technical, sales and production aspects. Disinfectants, similarly, will be covered from both the sales and technical scientific standpoints. Three talks on waxes are also planned.

In addition, reports of various N.A.I.D.M. committees will be presented at open meetings, which represents a departure from the practice of previous years.

The effect of the rearmament program on industry, the basing point pricing decision, and the latest developments in the Federal Trade Commission's setting up of trade practice rules for the wax industry are other topics of discussion slated for the meeting.

New officers are to be elected and three are to be named to the board of governors. Official opening of the convention on Monday morning will be preceded by various committee meetings and a meeting of the board of governors, on Sunday. The annual banquet Tuesday night and the group luncheon on Tuesday, which will be addressed by Tom Reid, vice-president in charge of human relations for McCormick & Co., Baltimore, on the subject of "Business is People," will be the social high spots of the gathering.

The panel discussion on low pressure aerosols is being planned to cover the subject from four different points of view. One will be: "Customer Acceptance of Low Pressure Aerosols," which will be handled probably by an advertising agency representative. The "manufacturing angle" will be discussed by a can company spokesman, while "Filling Procedure" is slated to be explained by someone from a firm specializing in filling low pressure aerosol containers. The final aspect: "Merchandising of Low Pressure Aerosols" is to be discussed by the merchandise manager of one of the large department stores. It is expected that the merchandise man will also touch on other types of aerosol insecticides.

**Admission to business sessions of the 35th annual meeting of the National Association of Insecticide & Disinfectant Manufacturers, Hotel New Yorker, New York, December 6 and 7, will be restricted this year to member firm representatives and guests invited with the approval of the Board of Governors. Others desiring to attend must request invitations by writing in advance to the NAIDM office, 110 East 42nd St., N. Y. All persons will be required to register at the meeting prior to admission. A special committee to act for the Board on non-member invitations and admittance to the meeting has been appointed.**

"The Efficiency of Low Pressure Aerosols in Relation to Formulation and Particle Size," to be presented by Dr. R. H. Nelson of the U. S. Department of Agriculture, may or may not be part of the panel discussion on low pressure aerosols. The paper is based on work done by scientists of the U.S.D.A.

Disinfectants will be considered in the following papers: "The Expanding Rationale of Chemical Disinfectants" by Dr. E. G. Klarmann of Lehn & Fink Products Co., Bloomfield, N. J.; "Sales Opportunities for New Disinfectants" by Michel Pijoan of the University of Colorado, whose paper is part of the general subject of "Residual Disinfectants;" and "Mold Control in Meat Packing Plants" by Dr. P. G. Bartlett of West Disinfecting Co., Long Island City, N. Y.

John Conner, N.A.I.D.M. counsel, will report on progress on wax products trade practice rules now under consideration by the Federal Trade Commission, and an as yet unannounced speaker will discuss the effect on business of the Supreme Court's ruling on the cement basing point decision.

The insecticide market and spray type insecticides will also be discussed, the latter by John Powell of John Powell & Co., New York, who will speak on the subject: "Possibilities for Expanding the Sale of Household Sprays." Following Mr. Powell's talk, Friar Thompson, of R. J. Prentiss & Co., New York, will preside during a floor discussion period.

"Some Factors Responsible for Recent DDT Failures to Control House Flies" is the title of a talk to be given by Dr. E. F. Knipling, chief, Division of Insects Affecting Man and Animals, U.S.D.A., Washington, D.C.

Dr. Alfred Weed of John Powell & Co., New York, will comment on the subject of DDT resistant flies and will serve as chairman for discussion from the floor.

Of general interest is an address, "Quartermaster Industrial Mobilization Program," which is scheduled to be given by Lt. Col. C. A. Shaunessey of the Army's New York Quartermaster office.

Carter Parkinson of McCormick & Co., Baltimore, is chairman of the program committee and John Calo of John Calo Co., New York, is chairman of the entertainment committee.

### Starts Own Firm

Ben P. Steele, formerly connected with Pennsylvania Salt Manufacturing Co., Philadelphia, recently opened his own business to deal in insecticides at 62 William St., New York.

**Wanted**—Large engineering firm wishes to acquire several complete soap plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence. Address Box 1215, 1474 Broadway, New York 18, N. Y.

**Wanted:** Chemicals—Alkalies — Colors—Solvents—Drugs—Oils and Foots. Soaps—Other Supplies. Chemical Service Corp., 92-A Beaver St., New York 5. Tel.: HAnover 2-6970.

## For Sale

**For Sale:** Two 200 gallon full jacketed Dopp Kettles with type 'L' Agitator. Also other chemical equipment. Allied Steel & Equipment Co., 1007 Springfield Ave., Irvington, New Jersey.

**For Sale:** Save ¾ths on insecticides. Large quantities Whitmire's Diro P-1 (Thiocyanate) and Pralytex P-10. (Rotenoid). Will ship gallons or drums. Address Box 430 c/o *Soap & Sanitary Chemicals.*

**For Sale:** Powder packaging line for cartons—includes carton former, bottom gluer, double spout filler, top gluer, compression belt, conveyor—forms for 12 size cartons. Perry Equipment Corp., 1510 W. Thompson St., Phila., 21, Pa.

### Watkins Sells in Newark

J. R. Watkins Co., Winona, Minn., recently were reported to be completely dismantling their Newark, N. J. plant and ceasing the manufacture of soap there. Allen B. Wrisley Co., Chicago, joint occupants of the building with the Watkins firm, have transferred their manufacturing operations from Newark to Chicago, from which point Wrisley will supply its eastern customers. The reason reported given by the Watkins company for the move is that the firm prefers to have its soap made under special brand. In addition, Watkins is said to feel that they can manufacture soap more cheaply in the west, and for that reason have the Newark plant up for sale.

Consolidated Products Co., New York, is reported to be liquidating the Watkins equipment.

## ROACH CONTROL

(*From Page* 139)

collection of 775 dead roaches was made of which 217 were definitely marked with fluorescein. The "Lincoln Index" assumed the following:

$$\frac{\text{Total marked}}{\text{Total unmarked}} = \frac{\text{total recaptured marked}}{\text{total recaptured unmarked}}$$

Thus the estimated roach population before spraying would be:

$$\text{Before treatment population} = \frac{630 \times 558}{217} + 630 = 2250 \text{ roaches.}$$

Six days after applying the blatticidal dust the procedure was repeated and a total of 53 roaches were trapped and stained. The following day, 14 marked specimens out of 25 were trapped. This results in an after-treatment population of:

$$\frac{53 \times 14}{11} + 53 = 94 \text{ roaches or an estimated 96 percent in roach population.}$$

The traps were run continuously for two months, the catch being released on inspection. Within a month, the collections began to increase and tests conducted on the floor surface indicated that much of the insecticidal efficiency had been lost. It is interesting to note that two months following the dusting about 100 to 200 roaches could be trapped per day and it was not until drastic environmental changes were made in the room that trapping numbers were lowered.

### Summary

PUBLIC Health organizations are suffering the loss of confidence of food plant operators through their inability to recommend sound measures against the roach infestation problem. The fundamental approach is through the alteration of environment. This embraces a concentrated attack on dampness, cleanliness of the establishment and limiting of harborage places. The use of blatticides will assist in reducing numbers if repeatedly applied, but without environmental measures offers little hope of extermination. Many insecticidal materials are toxic to roaches when applied as residual agents. Micronized dust formulations appear to be much superior to solutions by requiring less contact time, but are objectionable from the standpoint of appearance. Data are presented showing the relative efficiency of the newer synthetic materials applied as residual surface coatings. Where practical, trapping and marking of roaches may be utilized for population study before and after applying roach control measures.

### Acknowledgements

Acknowledgement is given to Dr. W. W. Cort and members of the Department of Parasitology of the Johns Hopkins University School of Hygiene and Public Health for their contribution of insectary facilities for insecticidal tests. The author is particularly grateful to Ferdinand A. Korff of the Baltimore City Health Department who has given helpful advice and has actively demonstrated practical measures of environment control; to Mrs. Loretta Peterson of the Department of Sanitary Engineering acknowledgment is made for assistance in conducting the experiments and in the preparation of this report.

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STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946, of Soap & Sanitary Chemicals, published monthly at Baltimore, Md., for October 1, 1948.

State of New York, County of New York.

Before me, a Notary Public in and for the State and County aforesaid personally appeared Wayne E. Dorland, who, having been duly sworn according to law, deposes and says that he is the Editor of Soap & Sanitary Chemicals and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, MacNair-Dorland Company, Inc., 254 W. 31st St., N. Y. 1; Editor-in-Chief, Ira P. MacNair, 254 W. 31st St., N. Y. 1; Editor, Wayne E. Dorland; Business Manager, Thomas Morgan, 254 W. 31st St., N. Y. 1.

2. That the owner is: (if owned by a corporation its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given).

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4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustee, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the months preceding the date shown above is ———. (This information is required from daily publications only).

WAYNE E. DORLAND, Editor

Sworn to and subscribed before me this 11th day of October, 1948.

HARRIET LEVINE, Notary Public.

Bronx County Clerk's No. 56. New York County Clerk's No. 624.

Commission Expires March 30, 1949.